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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

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If these men were operating company manager

We think they'd bu

A jeweler, accustomed to extreme accuracy in tiny parts, would surely approve the precision workmanship in the smooth-working, inner mechanism of Stromberg-Carlson's dial.

A strong-man, to whom anything weak is beyond consideration, would appreciate the way in which the rigid die-cast housing holds parts in perfect alignment—even after *millions* of operations.

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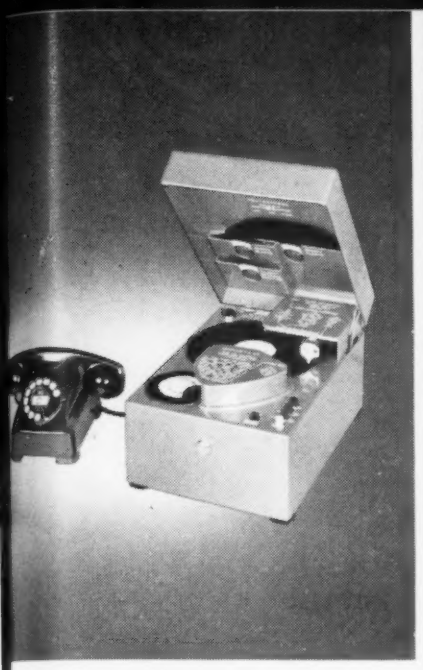

"Canned" Talk-out Messages are used on the
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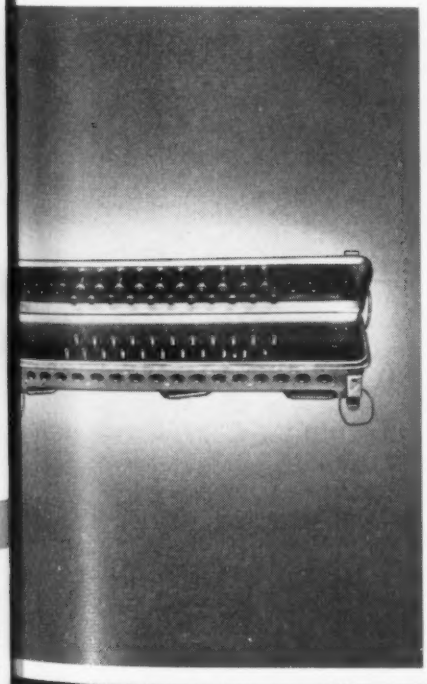

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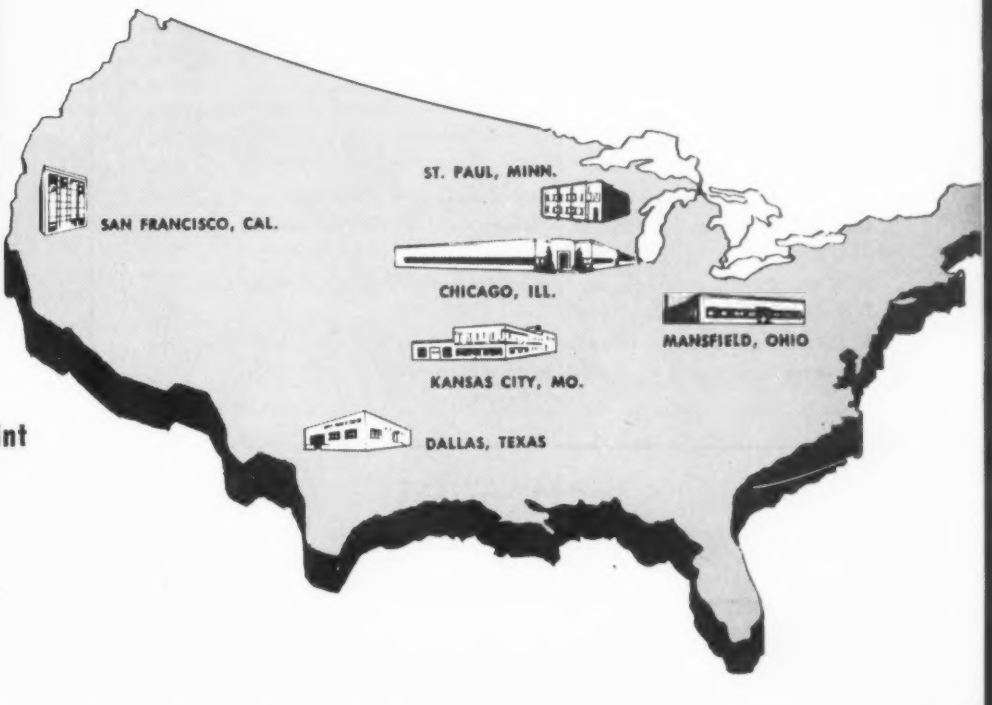

Your Nearest Kellogg Shipping Point Is Never Far Away!

FLASHES AND PLUGS

BEYOND RECALL. A Dallas, Tex., man spent 15 years as a game warden on the King Ranch, the state's largest. When a recent hunting trip turned sour for lack of targets, the man decided to shift his search to the ranch.

He put through a telephone call for an old friend, Bill Taylor, who had been a special officer on the same property.

The operator informed Long Distance that she had several William Taylors with varying initials.

"I want the Bill Taylor who is special officer on the King Ranch," said the man.

"Oh, yes," the operator replied. "Mr. Taylor died a few weeks ago."

There was a pause and then Long Distance spoke up.

"What shall I do, Sir? Cancel the call?"

"Yes," was the answer. "I doubt if we could reach him."

• • •

FAIR SNARE. Some months ago, a New Yorker talked overtime from a public telephone booth and when he had finished his conversation the operator requested that he deposit the additional amount due.

"I won't do it!" he snarled.

The operator, who had no specific instructions on how to handle a case like this, used her ingenuity and said:

"Oh, yes you will!"

"I'd like to see you make me!" came the man's defiant answer.

"Listen, mister," said the operator, "I've got a little button on my switchboard and if you don't make that deposit pronto I'll push it and lock the door of the booth so you can't get out. And don't forget, it's hot today!"

The money was deposited.

• • •

LITANY. A Denver, Colo., fellow who had patently started his Christmas celebrating a little early in the day walked into a business office.

He asked if he might use the telephone.

Noticing that the man was rolling rather heavily, the office manager asked if he might dial the number for him.

"Oh, no," said the man, "I can get it."

He fumbled out three or four numbers on the dial and put the telephone to his ear. After a moment, he shouted indignantly, "I did, too."

With short intervals, his conversation became, "I did, too . . . I did, too . . . I did, too."

He had got hold of the telephone company's mechanical voice, the one which says, "You failed to dial the number correctly."

CIRCULATION

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Telephony

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★ ★ ★ IN THE ★ ★ ★ NATION'S CAPITAL

by FRANCIS X. WELCH — WASHINGTON EDITOR

REA summarizes past year's activities. Annual meeting of NRECA occasion for "cards-on-the-table" discussion of power and REA policy. Plans made to combat recession talk. Reviews biography of Forbes, dynamic president and molder of predecessor of AT&T.

THE YEAR-END report of the Rural Electrification Administration was devoted for the most part to notes on progress in the rural electrification division. But it also contained some interesting commentary on what has been accomplished by REA in the way of financing rural telephones. Administrator Nelsen told Congress that 30,000 rural subscribers had received dial telephone service during the year 1953, thanks to REA loans.

The year-end report included a list of 45 modernized systems in the following states: Alabama, Florida, Kentucky, Michigan, New Jersey, North Dakota, Oklahoma, Utah and Wisconsin.

Stressing the wide range of coverage by REA rural telephone loans, Nelsen's report pointed out that over half of the states in the Union now have telephone systems which have obtained REA loans. Leader of the list was Minnesota with eight REA-financed systems, closely followed by Texas with seven.

Pointing to progress actually made during the past year of the Eisenhower administration, Nelsen said the 30,000 dial subscribers were twice as many as were installed during the first three years of the REA rural telephone loan program.

In the matter of actual telephone construction, under REA financing, there has also been a relative pick-up of activity during the past year. In 1953, REA telephone loans approved amounted to 49 million dollars which was less (by 6 million dollars) than the amount approved in 1952. But, in the matter of funds actually advanced on loan—which is what really starts the ball rolling on plant construction—the total almost doubled from 15 million dollars in 1952 to 26 million dollars in 1953.

REA's 1,000 financed electric systems (nearly all co-ops) connected their 4 millionth customer last September. They continue to add about 15,000 a month. Over 50,000 miles of power lines were constructed in 1953, making a total of more than a million miles of line for all REA-financed electric systems, now operating in 46 states.

REA Co-op's Annual Meeting

REA Administrator Nelsen made another kind of report last week when the National Rural Electric Cooperative Association (NRECA) held its annual meeting in Miami, Fla., Jan. 11-14. It was not a new setting for Nelsen. He had been to previous meetings of the NRECA in his former capacity of a state cooperative director from Minnesota. But it was his first appearance as head of REA. And the circumstances in Miami were such as to test his mettle as a peace-maker and diplomat.

NRECA's full-time executive director, Clyde Ellis, has been sniping at certain officials of the Eisenhower Administration who have been held responsible for recent federal power policy. Officials of the Interior Department have been especially singled out by Ellis. Secretary McKay has been charged with undercutting the statutory right of the REA co-ops to get all the power they want, or need, from federal power projects on a preferred basis, as compared with the business-managed tax-paying private electric companies.

Another recent development which is disturbing Mr. Ellis, according to his speech at the Miami convention, is the apparent loss of enthusiasm on the part of the REA co-op membership for continued membership support and growth of NRECA.

Referring to the finishing of its first year of existence under a complete change in federal administration, Ellis said that an audit would have to be completed to determine whether NRECA had finished the year in the black or in the red. He personally thought it had just about broken even.

Anyway, into this NRECA party at Miami, came plain-spoken Assistant Secretary of Interior Fred C. Aandahl. He stoutly defended the Eisenhower power policy, as designed to encourage more local partnership and cooperation between both public and private agencies in the sale and development of power from federal multi-purpose projects.

Then, Aandahl accused the NRECA—right on the floor of its own convention—of fostering a "federal power monopoly." He quoted previous statements by Ellis, which he said bore out that charge.

Firing away from the other side was Senator Maybank (D., S. C.) who accused the Eisenhower Administration officials of trying to scuttle the "preference clause" for REA co-ops. He predicted that the Eisenhower budget would seek to cut REA appropriations, and promised to fight for their restoration—just as happened in Congress last year.

With all these fireworks going on, Administrator Nelsen's speech was a relatively calm and non-controversial review of progress during his first year as REA chief. For example, in replying to certain critical suggestions that REA is trying to smother the so-called "super co-op" loans (for generating plants and transmission lines), Nelsen said it wasn't so. He said REA will continue to make "super co-op" loans; but that the best policy for such loans is to use them with discretion—where they will do the most good.

Back in Washington, D. C., there

was an echo from the White House over all this power policy controversy. President Eisenhower sent a letter to Senator Langer (R., N. D.) who is one of 28 senators who have asked Ike to delay the Interior's new power policy rules. Ike's letter backed up his subordinates 100 per cent.

Recession Propaganda

Another message delivered by President Eisenhower in Washington last week was one which was not released for publication. It was a talk personally delivered before a meeting of the National Advertisers Council. While the text of Ike's remarks was not made known, it isn't hard to guess that they were about the "prophets of doom" and "peddlers of gloom" who have been whooping it up lately about the size and extent of a possible business recession in this country in 1954.

Nor is it difficult to spot the motive for this sort of talk, if one considers the source. Mostly it comes from disgruntled political opponents of the administration, who are behaving as if they almost longed for another economic depression to sweep them back into power, as it did in 1932.

What such an economic setback might do to the country, or to its security in the present critical international situation, seems to be with them a secondary consideration.

At any rate, the President feels that it is time the business community showed some statesmanship by way of rebutting such gloomy talk, which of itself could be dangerous from the standpoint of mass psychology.

The National Advertisers Council, which is composed of heavy space advertisers for all lines of business, considered a counterattack. The idea would be to donate or earmark a considerable amount of space advertising to emphasize the positive aspects of our dynamic economy. Such things as the growing number of young families, and number of children per family; the steady increase in demand for housing, appliances, etc., are clear, demonstrable facts. If they can be driven home by advertising, or by any other means, to the average American citizen, they would go a long way towards blocking any selfish special pleading for a recession based on political expediency.

Recent telephone company advertisements, both Independent and Bell, have stressed these positive aspects of future growth in the telephone business. Two weeks ago, before the New York Society of Security Analysts, J. J. Scanlon, treasurer of AT&T, gave substantial reasons why the telephone industry *must* keep on growing in future years. He called attention to the large number of households still without telephone service, the increase in the telephone habit, and the small increase in telephone rates compared to the rise in other living costs.

Most persuasive of all was his reference to the fact that the telephone industry has been so busy, since the end of the war, trying to catch up with business demand already on file, that it had not even tried to stimulate more demand. Yet, if such were needed, a number of different stimuli—such as a campaign to put a second telephone in the average home, are ready and waiting to be used. They would get results, too.

What is happening right now, to some extent, is a rearrangement of spending habits. Economists call it "budget coalescence." New young families, with new babies, here or on the way, are finding themselves more and more committed to such necessary budget items as payments for homes, insurance, appliances, medical attention and groceries, children's clothing, etc. All this means less money available for deferrable items, such as liquor, cigarettes, jewelry, entertainment, new or second family automobiles, a suit for Dad or a new fur coat for Mom.

Even in the telephone business, despite predictable growth in the number of stations, the corresponding curve for toll revenue is likely to flatten out in the year or so just ahead, as compared with the sharp rise per station in the years just passed. The young couples who used to call Aunt Minnie in Jersey once a week, are going to stretch it out, or wait until Aunt Minnie calls *them!* There are other places for the money right now.

But this is all to the good, and only temporary—certainly, *nothing* to worry about.

Wanted on the Telephone

Following a modest flurry of books in the Forties about telephone pioneers and industrial beginnings, things have been rather quiet of late along the literary front. Arthur S. Pier recently struck up a new fire on this hearth with his book entitled "Forbes: Telephone Pioneer," 232 pages, Dodd, Mead & Co., New York.

William H. Forbes, distinguished but sometimes forgotten figure in these days, was the son of one of America's great industry tycoons of the Civil War era. In addition to this heritage, he had remarkable abilities and cultivated tastes of his own. A typical New England gentleman, Forbes had many excellent friends, a flair for sports, pleasant entertainment, and enlightened conversation.

But he did not then follow the path of his well-born literary acquaintances —the Adams's or the James's—writing books about their ofttimes condescending reaction to the boisterous mid-nineteenth century America. Forbes used his time, talents, and heritage to grow another dimension and developed a new career at a time of life when many rich men's sons have been satisfied to take a bow on a successful business career. As a comparative youth, Forbes had become partner in a western enterprise which his father started after his own success as one of the early China traders, out of Massachusetts. This western enterprise was the Chicago, Burlington & Quincy Railroad.

William Forbes, as shown in Pier's small-sized memoir, also joined in his father's banking and investment interests, and southern plantations, until the economic depression of the 1870's when he was still in his late thirties. Up to that time he had rounded out a career as the scion of a New England mercantile fortune by serving honorably in the Civil War in company with Oliver Wendell Holmes, marrying one

(Please turn to page 39)

REA Approves Loan In Louisiana

The Rural Electrification Administration on Jan. 12 announced the approval of one telephone loan during the week of Jan. 4 to 8. Details of the loan follow:

Forest Hill (La.) Telephone Co., $287,000, second loan to this borrower.

The new loan funds will finance the construction of facilities to serve 490 subscribers not provided for in the first loan of $123,000 which was approved in June 1952.

The two REA loans will enable the company to bring new and improved service to 809 subscribers in Rapides Parish. The company will rebuild 40 miles of existing line and add 150 miles of new line and other outside plant facilities to serve 586 subscribers now without telephones. The central office for the system will be located at Glenmore.

Completed, the Forest Hill company will consist of 189 miles of line.

The OPERATOR'S CORNER

by MAYME WORKMAN, Traffic Editor

HOW MANY operators know who the first woman telephone operator was, and what year she was employed? Reading an article recently which appeared in the *Los Angeles Times* reminded me that it was Emma M. Nutt, who was employed in Boston, Mass., in 1878.

The 75th anniversary of the employment of the first woman telephone operator was celebrated with a dinner in the Pacific Telephone & Telegraph Co. clubrooms. Mrs. Mary Wefso was given public recognition at this event as the oldest telephone operator in point of service in the southern California area. Along with her citation, 38 women with long service records in Los Angeles and 112 veteran telephone operators in southern California were honored.

Mary Ann Callan, women's editor, *Los Angeles Times*, gave these interesting facts concerning Mrs. Wefso, in an article published in the *Times*:

"Despite the fact that within the next decade or two you will be able to pick up your telephone and dial New York or Timbuktu, a local telephone operator who has gone through more than 48 years of service at the switchboard still believes there will be a place in the future for the human telephone operator.

"During this, the 75th anniversary of the employment of the first woman telephone operator, Mrs. Mary Wefso, 18 months from her golden jubilee year with the telephone company and retirement, reflects optimism for the women who choose her career. She has seen service during earthquake, flood, and two world wars—to be the operator with the longest period of service in the Southland.

"'There will be a place for women in this work,' Mrs. Wefso stated emphatically. She has seen telephone service change from manual operation, where every call took an operator, to the present dial system, where all but long distance calls are dialed by the person placing the call—the start of a new era of key operating, which will practically displace the long distance operator in major population areas.

"'Even so', she said, 'the dial system didn't end our work. Right now there are 4,600 telephone operators employed in the Los Angeles area, as compared with 300 in 1905. If we didn't have the dial system now, we couldn't fill the jobs that it would take for the old manual system. There just aren't that many women available.'

"Right now Mrs. Wefso is training students of long distance service in a course which takes on an average of 18 days. Her face was wreathed with smiles as she related some of the humorous miscues the students make.

"'As they place practice calls', she said, 'the girls write down the place of the call. For some, Colfax sounds like "cold facts," Seventh-day Adventist School becomes "Seven Days at Venice School." Hartford, Conn., is "Hotfoot." And for those who still have nursery rhymes on their minds, Cedar Rapids, Iowa, comes out "Peter Rabbit."'"

But even so, Mrs. Wefso said, the girls learn the ropes, or *wires* of the job.

She said some of the most exciting times for her came before radio and television. During Taft's election as President in the early 1900's, the switchboard was flooded with calls. The chief operator instructed all of them to simply say, "Taft is President. Number please." Or, at another time, the greeting was: "Johnson knocked out Jeffries, 13th round. Number, please."

She said her beginning salary as a telephone operator (Chicago, 1905, at the age of 15) was $20 a month for a 48-hour-or-more week. Starting salary now is more than eight times that amount, with time-and-a-half guaranteed for every hour over 40 hours a week.

Mrs. Wefso's career as a telephone operator in Los Angeles began in 1911, when she worked as an operator in the old main office of Pacific Telephone & Telegraph Co. In 1913 she was transferred to the long distance mutual office, where she remained until recently becoming an instructor in the training school. After her retirement in 1955 she hopes to do some traveling—perhaps, to points on the map where she helped place thousands of calls, but has never seen.

Mrs. Wefso is a soft-faced woman with a soothing voice who probably has said "Number, please" almost as many times as there are people in America. But she is not tired of her job yet, and expects to have no aversion to answering the telephone when it rings after her retirement.

If by chance Mrs. Wefso should read this article, our congratulations and best wishes to her on her many years of loyal service in the telephone industry. And we hope her well-earned years of retirement will be enjoyed to the fullest extent.

Traffic Questions

(1) What entries are made on the toll ticket when word is left on a call?

(2) Where should tickets be sent after leaving word?

(3) Is the phrase "WH released" still used?

(4) How should you proceed when a WH party report is received from TTC over regular TX trunks?

(5) On a WH party report if the calling telephone says that no one is calling, what should the operator say to the calling party?

Answers are presented on page 42.

V V

"I place economy among the first and most important of republican virtues, and public debt as the greatest of the dangers to be feared."—THOMAS JEFFERSON.

2.01 Industrial television equipment.

new devices and techniques

*by Ray Blain**

PART I

1. GENERAL. The Independent telephone industry has ever been willing to adopt new ideas, methods, tools and equipment. This pioneering instinct has paid good dividends down through the years in the provision of better and more economical communications. With the belief that this spirit will continue in the future, and contribute to the further development of our industry, the (USITA) Plant Committee offers the following new devices for your consideration.

2. EQUIPMENT

2.01 *Industrial Television Equipment.* Industrial television provides a means of viewing at a distance, a clear, exact, instantaneous picture of a scene or operation where direct observation is too dangerous, too inaccessible, too inconvenient, or too expensive. The picture is picked up by an extremely small, light-weight camera and transmitted by a single cable to a conveniently located viewing monitor. By using more than one camera, a single observer may watch a number of widely separated points and, through the use of multiple receivers, observers at different locations can all view the same scenes simultaneously. Close-ups of experiments, demonstrations, and microscopic studies can be enlarged and projected for more convenient and comprehensive viewing by large groups. (See cut.)

A standard RCA industrial television chain consists of a miniature camera and a compact control monitor, connected by 18-conductor cable, .625 inches in diameter. By means of this cable, the picture picked up by the camera is transmitted to the control monitor's 10-inch viewing screen. This lightweight two-unit chain operates from ordinary 115-volt, 60-cycle power supply and is completely self-contained. Complete power consumption of the entire equipment is only 230 watts.

The RCA industrial television camera is as small and easy to handle as the average 16-mm movie camera. It contains only three tubes, one of which is the revolutionary new Vidicon Photoconductive Camera Tube developed especially for industrial television.

The RCA industrial television monitor is a combination power supply, control panel, and monitor, all housed in a metal case smaller than the average table-model home TV receiver. This unit contains all the controls for the operation of the complete two-unit chain: picture brightness and contrast; camera controls, including beam intensity, electronic focus, and optical focus. The optical focus control operates a small reversible motor which changes the focus of the lens.

Television, the world's newest entertainment medium, has now become the latest means of intercommunication. In banking, commerce, industry, science, and education, industrial television promotes safety, increases efficiency, and implements economy.

2.02. *Magnetic Impulse Counter.* The magnetic impulse counter is fundamentally a relay with 10 armatures. They operate in sequence, responding to pulses of current applied to a driving winding. Once operated, the armatures remain operated on residual magnetism. Each armature, upon operating, actuates a spring stack which consists of a normally open ("make") contact and a normally closed ("break") contact. When a pulse is applied to a release winding, all operated armatures release and all "make" and "break" springs return to the non-operated position. (See cut.)

Tests to determine the counter's ability to remain operated on its residual magnetism proved that the armature will remain operated with no current applied to either the driving or release winding for more than four months. Since this is beyond all reasonable requirements, the test was discontinued at this point without any indication that the initial residual magnetism failed to hold the armature operated.

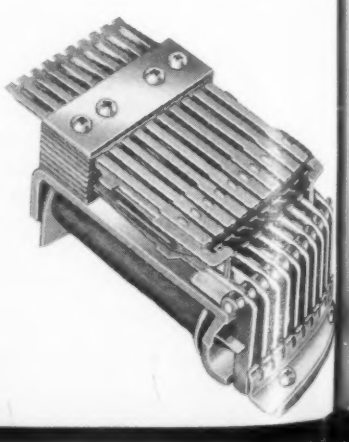
The impulse counter, designed originally as a component of a dial switching system, has now also been introduced to industry. There appear to be many varied applications for this device for use in control circuitry, mobile radio, telemetering and computer circuits. It can, in fact, be used in any application where counting, marking or storing is desired. Rapid in operation, it will count as high as 30 impulses per second in a properly designed circuit and with the proper type of pulse.

2.03. *Key Type Telephone Switching System.* This key type telephone switching system provides any telephone user with a faster, more flexible and economical service at a minimum initial cost. (See cut.) Each individual user is provided with "answer," "hold" and "intercommunication" facilities. Each station may perform the following services:

(1) Answer and originate telephone calls on one to five central office trunks.
(2) Hold and/or transfer telephone calls to any other station in the system.
(3) Converse with other stations over intercommunication facilities.

It is not necessary to purchase special application telephone instruments

2.02 Magnetic impulse counter.



*Mr. Blain, technical editor of TELEPHONY and member of the Plant Committee of the United States Independent Telephone Association, prepared this paper for the USITA Convention plant conference.

2.03 Key type telephone switching system.

equipped with push buttons as this system will operate with any two-conductor standard telephone.

The following operating features may be provided by this system:

(1) Each station has full access to all central office trunks. Any individual may originate outgoing calls, or may answer, hold or transfer any incoming call.

(2) Intercommunication between all stations.

(3) Any station may be code signalled by any other station.

(4) Flashing lamp signals on station key boxes indicate incoming calls. This same lamp remains permanently lighted during the period that the trunk is busy.

(5) Audible trunk chime signals can be furnished if desired.

(6) Central office trunks will operate with manual (24-volt) or dial (48-volt) main exchanges.

(7) Central office trunks will not cross if two buttons are accidentally operated.

Key boxes used on the system are available in four and six-button. These may be placed on the desk or mounted on the side of the desk or on any flat surface within convenient reach.

Ample talking and signaling power for the system can be provided with a No. RFR-1027 Raytheon rectifilter, or equivalent. This rectifilter operates from 110 to 125 volts ac single phase, and delivers 24 volts dc for talking and 24 volts ac for operation of the lamps and signal buzzers.

2.04. *Electronic Ringing Generator.* This new electronic ringing generator claims the following features (See cut.):

(1) Supplies ringing power electronically without the use of any moving parts.

(2) No contacts to clean, space or burn out—nothing to wear or require adjustment.

(3) Plug-in components insure easy maintenance — permit replacement of complete oscillator amplifier chassis, oscillator network units or electron tubes in less than a minute.

(4) A high degree of frequency stability and reliability under varying conditions of room temperature, humidity, ringing load, and voltage input.

(5) Ample power output—up to 25 watts per single frequency—125 watts total.

(6) Operates from commercial 105-125 volt ac power source.

(7) Economical in power consumption—requires only 350 VA input under full load—125 VA no load.

(8) Not dependent on close frequency tolerance of commercial or standby power source—may be operated from a battery driven converter delivering 115 volts, 60 cycle ac.

(9) Completely silent in operation.

(10) Mounts on standard 19-inch relay rack—may be fitted to wider racks with adapter plates.

Required frequencies are available for operation of the harmonic, synchromonic, decimonic or special systems. Ringing voltages are adjustable from the nominal values. The voltage variations are dependent on the frequencies. The range is from minus 10 to 25 per cent, and plus 12 to 20 per cent.

2.05. *Transistorized Telephone.* This telephone is provided with a transistor amplifier arranged to amplify incoming speech signals only and is primarily intended for use by persons who are hard-of-hearing. The amplifier unit is incorporated in a standard Type 40 Monophone housing, the only external change being a volume control knob which is centrally located on the rear sloping surface between the vertical walls which form the cradle. The provision of the volume control enables persons with normal hearing to use the monophone without distress. (See cut.)

The anti-sidetone feature of the regular monophone circuit is not affected by the modification. However, the loss introduced by this circuit is overcome by the amplifier at full gain, thus causing howling if the receiver is removed from the subscriber's ear without lowering the volume. When circumstances permit use with reduced transmission efficiency, the transmitter may be shunted to prevent howling under these conditions.

The amplifier unit measures 3 inches x 1 inch x ⅞ inch and is mounted on the bracket which supports the ringing capacitor on the base plate. The volume control is separately mounted on the rear panel of the housing adjacent to the induction coil. A 10-conductor cable connects the amplifier unit to the volume control and to other points in the telephone circuit.

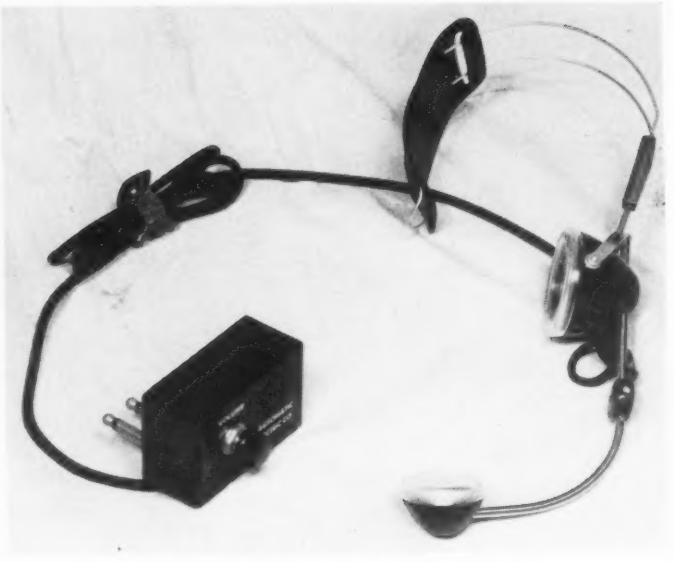
A considerable wiring change is involved when incorporating this unit in a standard telephone because of the necessity of arranging the circuit so as to maintain the proper transistor supply voltage polarity irrespective of the direction of current flow over the line conductors. Four germanium diodes are provided in the unit to accomplish this end. In addition, there is a single junction transistor which is connected as a grounded-emitter am-

2.04 Electronic ringing generator.

plifier. To insure stable operation of the transistor, it is operated grounded-base in so far as dc is concerned. Screw terminals are provided to permit ready replacement of the transistor. A high impedance receiver is substituted for the usual low impedance receiver to avoid the need for a coupling transformer between the transistor collector circuit and the receiver.

2.06. *Operator's Headset with Transistor Amplifier.* This amplifier unit was designed by the Analytical Research Laboratory of the Automatic Electric Co. in response to a request from an operating telephone company for information about apparatus for assisting operators who are hard-of-hearing. The unit measures 2¼ inches x 2¼ inches x 1⅜ inches and replaces the plug in which the leads from the headset normally terminate. This arrangement avoids added encumbrance to the operator while permitting her to transfer conveniently from one position to another. In use, the amplifier unit is plugged into the operator's jack and the gain is regulated by the operator with the volume control extending from the front of the unit. The switchboard circuits need not be disturbed since the transistor amplifier obtains its operating voltage from the drop across a 100-ohm resistor inserted in series with the transmitter circuit within the unit. (See cut.)

The amplifier uses a single junction transistor in a grounded-emitter transformer coupled circuit. To insure stable operation of the transistor it is operated grounded base in so far as dc is concerned. Screw terminals are provided to permit ready replacement of the transistor. The four leads from the headset also connect to screw terminals, enabling the unit to be easily attached to a standard Western Electric Type 52 headset in lieu of the conventional plug normally furnished with this headset.



2.06 Operator's headset with transistor amplifier.

2.07. *Recorded Message Announcer.* Progressive telephone companies recognize the advantages of intercept service to themselves, and to their subscribers. Typically, calls are intercepted if they are directed to changed numbers, to numbers erroneously listed in the directory, to numbers disconnected for any reason, to unassigned terminals or vacant lines, or to any other number which the company knows will not answer. The subscriber benefits because his time is not wasted in attempting repeatedly calls that cannot succeed. The company benefits because its equipment is not tied up by repeated futile call attempts. (See cut.)

The Recorded Message Announcer is a device intended to introduce a prerecorded announcement onto a telephone line or trunk in certain circumstances. At the time development of the device began, it was intended to provide intercept service in unattended automatic offices, but it was recognized early that a device of this sort would have numerous other uses in telephone plant. Another use for the device has already been found—delay announcements on toll lines under all-trunks-busy conditions.

Besides the uses mentioned above, it has been proposed that this announcer could be used with postpay coin lines and reverting call switches to provide an announcement that would hold the called party until the calling party is prepared to speak. A modification of the unit could be used by volunteer fire departments to announce the location of a fire to their members. It might also be used to give "time is up" announcements on trunks with automatic conversation timing.

One to five separate sound tracks (channels) may be provided. Each channel can announce to as many as eight lines simultaneously without appreciable loss of volume. Subscribers hearing the announcement at the same time cannot speak to each other.

An announcement can be "erased" and a new one substituted in a matter of minutes. An announcement does not "wear out." Once recorded, it will play back indefinitely. Maximum length of the message is about seven seconds.

The unit consists of a drum mechanism, an erase and record amplifier, and from one to five playback amplifiers.

The drum mechanism consists of the drum proper—a cylinder the surface of which is covered with a magnetic material—a motor and a drive mechanism to move the drum at a constant speed, and a cam arrangement which provides an electrical mark for the beginning of an announcement. One of these units is necessary for each office to be served.

One to five playback amplifiers can be connected to each drum mechanism, depending on the number of channels

2.05 Transistorized telephone.

desired. Each amplifier is complete in itself and need only be connected to the commercial power lines to be operative. A magnetic pickup head is connected with each playback amplifier by a patch cord. The head is actually mounted on the drum mechanism base, but for pricing and packaging purposes it is associated with the playback amplifier.

The erase and record amplifier is used to erase an old announcement and record a new one. This amplifier is also completely self-contained and needs only a source of commercial power. It is arranged to be conveniently portable, so that one amplifier can serve several announcers, but it may also be permanently mounted on the rack with the drum mechanism and playback amplifiers if only one announcer is to be served. In use, the amplifier is connected to the same pickup heads used by the playback amplifiers, by means of the same patch cords.

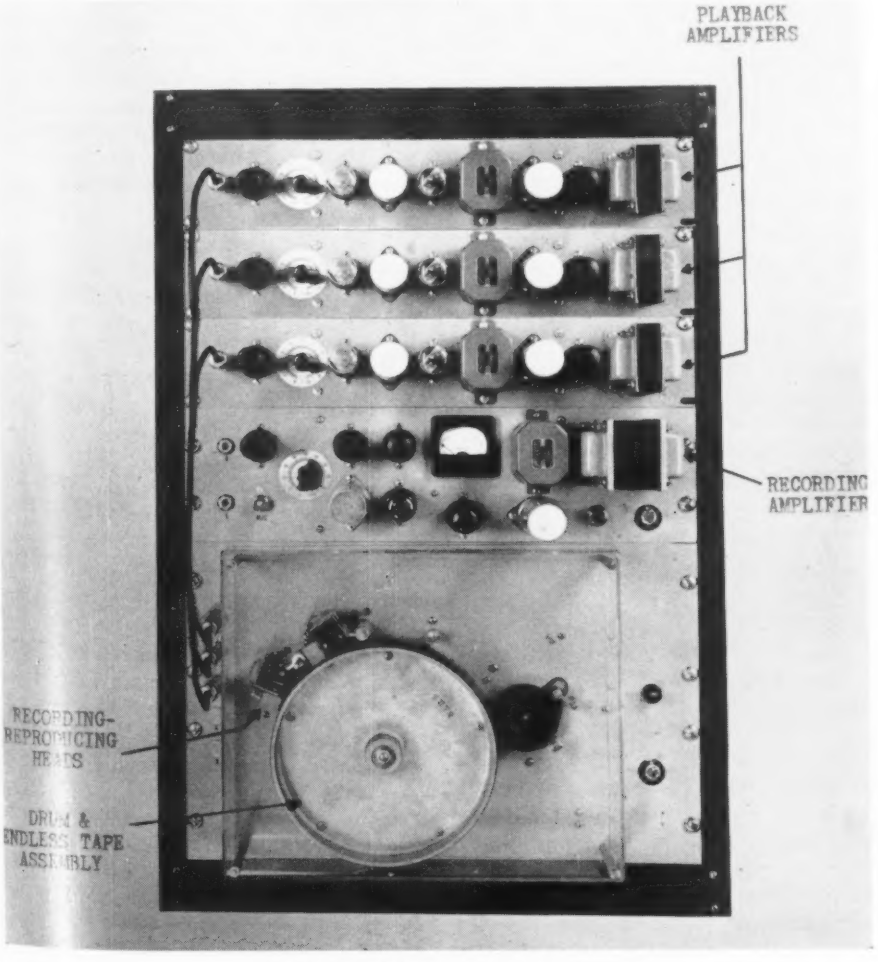
It will be seen that this design provides the utmost flexibility. An operating company need purchase only the equipment immediately necessary (a drum mechanism, an erase and record amplifier and one playback amplifier would be the minimum). Since there are no common power supplies, etc., additions up to a maximum of five channels can be made at any time without consideration of the capacity of the equipment already installed.

2.08 The Semavox

2.08. *The Semavox.* This device is designed to provide effortless telephone service at the command of the user. Born of an ambition to provide the handicapped with telephone independence, it is now extended to the industrial field. The Semavox is a portable electronic telephone instrument, embodying automatic answering and automatic disconnecting circuits. The ringing current on an incoming call automatically connects the loud speaking telephone of the Semavox to the line. On the completion of a conversation, when the calling party hangs up, Semavox is automatically disconnected from the line and remains ready to receive the next incoming call. (See cut.)

To install, this device is merely connected to any standard telephone line and the power cord plugged in any convenient 100-volt ac outlet.

Semavox is available in four different models: (1) Standard "D" series unit for dial exchanges; (2) "M" series for manual exchanges; (3) "PC" series unit affording privacy; (4) "K" series unit adapted to key telephone systems from one to six lines.



2.07 Recorded message announcer.

Obligation

"The fact is that if a safe majority of us are to get enough economics to guide us properly—and to keep us from letting ourselves be guided improperly and to our destruction—we have to find a way for 10,000,000 discussion leaders—without props or prior formal training in economics—to take themselves and eight or ten associates each through a beginning discussion course in the arithmetic of our freedom as found in the study of money and inflation, direct and indirect taxes, incentives, savings competition, technological development, risk, and profit and loss in the free market run by free persons."—L. R. BOULWARE, *vice-president, General Electric Co.*

THE PLANT MAN'S Notebook

by Ray Blain, Technical Editor

THE FOLLOWING letter has just been received from Arnold Benson, president of the Pecos Light & Power Co., Inc., of Pecos, N. M.:

"Our experience is largely with power systems, but for the past five years we have operated a very small telephone exchange which was converted to dial operation this past January. We operate it in conjunction with our power system. Hence, the following comments on your discussion of the question on lightning entering cable from rural lines in the June 6, 1953, issue, page 23, are based on our power experience. However, lightning is lightning wherever you find it.

"First: Arrestors at a distance from the point where the open wire line enters cable are more or less a waste of money. Two arrestors in parallel right at the terminus of the open wire line give better protection than one arrestor there and one at a distance from the terminus. Any irregularity of a line, such as going from open wire to cable, causes partial reflection of the lightning surge at this point, thus increasing the potential above that of the incoming wave. Therefore, that's the place to put the protection.

"Second: Everything at the protectors must be tied to the arrestors or grounds. The protectors should be as close to the cable terminals as possible; also, good solid short connections to the protectors and solid heavy leads from the protectors to the ground are necessary.

"The cable sheath and messenger should be solidly connected to the ground side of the protectors. Any guy wires, metal enclosures, etc., mounted on this pole should also be connected to the same ground wire.

"If a good low resistance ground connection is not readily obtainable at the base of the pole, then it is well to treat this ground with calcium chloride or some other material which will reduce the ground resistance to a suitable value. A lightning arrestor is only as good as its ground."

• • •

The Frahm Reed Relay is an electromechanical device which responds to an alternating signal having frequency and amplitude values that lie within specified bands. The transmission of any number of control signals over a single circuit is said to be simplified with reed relays, and their use is not limited to wire circuits but may be extended to all types of communication circuits, including radio.

In a typical application, a control function is used to turn off or on a series of low frequency signals (50-500 c.p.s.). The signal is transmitted either on a wire line, or as a modulated carrier to some remote location where it operates a reed relay to indicate the control function at that point.

Since each relay will respond to a narrow band of frequencies, it is possible to operate a number of relays simultaneously by making use of an equal number of source generators arranged so that none of the operating frequency bands overlap.

In the range of 200-500 cycles, it is possible to operate up to 16 channels with no interference between channels. Where four relays are used, 1,840 control functions can be handled.

• • •

The *Pacific Telephone Magazine* recently carried an interesting article titled "Modern Muscle Savers," which described the use of mechanized tools by modern linemen. This article mentions the fact that muscle, plenty of heft and just plain "he-man" brawn were a good part of what it took to be an old-time lineman. There was sweat and strain aplenty in plant jobs then—and the old-timers had (and still have) a right to be proud of their work.

That doesn't mean today's linemen are a bunch of weak-kneed pencil pushers. They've got as much muscle and they pitch in on the job just as fast as the old-timers did. The only difference is they've substituted skill with new tools for muscle power on a lot of chores the old-timers sweated and strained over.

Today's mechanized tools mean a man gets his job done faster and easier. He doesn't go home quite so tired as he used to. Sure, modern muscle-saving tools save the company some money, too.

One of these new tools is the pneumatic tree trimmer and chipper. Anyone who has ever swung an axe or a brush hook clearing brush along a right-of-way will agree these tools are muscle and time-savers. The tree trimmer, operated by an air compressor, looks like a long metal gaffing hook. It cuts through branches up to 2½ inches in diameter with ease as the blade flashes back and forth 80 to 100 times a minute.

The chipper literally eats up the cut brush, spewing out a residue of paper thin flakes that quickly disperse without muss or fuss. It will take branches and limbs up to 4 inches in diameter. The branches are fed to cutting blades mounted on a rotating cylinder.

Another welcome successor, this one to the pick and shovel for buried cable laying, is the Jeep-A-Trench. This device is a four-wheel drive Willys Jeep equipped with a power take-off arm for digging trenches. On one job out West, these "burrowing babies" dug 18,600 feet of trench in a 17-day period.

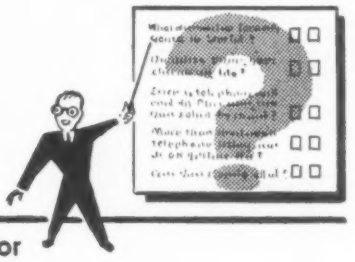
When it comes to hoisting poles for setting there is also something new in an ingenious hydraulic derrick mounted on the bed of a line truck. Nineteen feet long and weighing about 675 pounds, this efficient lifting apparatus can hoist up to 4,500 pounds—even extended at an angle 10 feet off perpendicular. Energy transmitted through a power take-off to the hydraulic cylinder in the center leg of the derrick does the work. Nor is the derrick cumbersome when it isn't in use.

A mechanical hand tool that carries the trade name of "Impactool" is saving muscles in the southern California area. It's used to drill holes for pole line hardware, including such attachments as cross-arms, pole steps, bent eye bolts, and through bolts. In addition, it can be used for tightening nuts on three-bolt clamps in making up guys and other strand attachments.

It is true that the use of many of these modern tools requires an electrically equipped truck. The provision of this feature is not difficult, however, by utilizing one of the small, efficient, gasoline-engine-driven power units now available.

It goes without saying that anyone who has used today's efficient plant tools would be dead set against swapping them for the muscle-spending methods of the "good old days."

PLANT MAN'S QUIZ



by RAY BLAIN, Technical Editor

Q. Will it be possible for impurities in underground conduit to cause corrosion trouble on lead-covered telephone cable?

A. Several cases were reported about 20 years ago where fir and pine creosoted wood conduit caused corrosion trouble on lead cable. This conduit was made of green wood and we have not had any reports of similar trouble in recent years.

It is believed that present-day manufacturing methods have eliminated the possibility of trouble of this nature when wood conduit is used. Actually, wood conduit is seldom used at the present time, perhaps due to the shortage of suitable timber.

There are also several cases on record where conduit made of concrete has caused trouble as a result of corrosion on lead-covered cable. It is believed that in these instances the free lime in the conduit was the cause of the trouble.

There is absolutely no danger of vitrified clay, cement-asbestos, fibre or soapstone causing corrosion trouble. Chemicals in the soil occasionally drain into ducts and cause corrosion trouble on lead cable, an action mistakenly blamed on the conduit.

• • •

Q. Will you please advise us how we may fabricate a howler for use in signaling our customers when they leave a receiver off the hook?

A. In our opinion, a better plan would be to procure a howler from one of the equipment manufacturers which would be especially designed to provide the type of service you desire. This unit will prove more satisfactory than one that could be fabricated locally.

Howlers supplied by equipment manufacturers may be powered by a booster coil combined with an adjustable interrupter arranged to change direct current to a high frequency pulsating direct current.

• • •

Q. We would like to know what precautions, if any, may be taken so as to prevent injury to other underground utilities when using a power digger to open a trench for a new underground conduit system?

A. One plan used successfully by some contractors is first to locate all utilities in or near the path of the new trench and then expose them by the hand-digging method. Existing utilities may be located from drawings and records or by the use of suitable testing instruments.

The above practice will reduce lost time for the trenching machine and in most cases will prove a real economy.

• • •

Q. Is it considered necessary to use disinfectant at regular intervals on the transmitter of public telephones in order to prevent the spread of disease?

A. Exhaustive tests made by one large operating company indicate that germs do not collect on a transmitter or handset to cause the spread of disease or infection.

Public telephones should be cleaned at the required intervals, but, under ordinary conditions, the use of a disinfectant is not considered necessary.

• • •

Q. Please advise us how we may prevent the flattening of cable when it passes over pulleys as it is being pulled into underground conduit.

A. In our opinion, you may be using pulleys with too small a groove or of too small a diameter. If you make use of a manhole skid or a sheath and shackle equipped with properly designed pulleys, you should not experience trouble with the cable flattening.

• • •

Q. Is there a machine that will remove spinner wire from cable that must be recovered and replaced with a larger size?

A. We do not have information of a machine of this type being available at the present time.

Some companies make use of a hook arrangement to pull the spinner wire along the span to the pole when cable is being removed. The turns must then be cut one at a time to remove the loop wire from the strand.

Perhaps someone will eventually recognize this need and design a machine to unspin cable and coil the wire.

• • •

Q. Will there be an objection to the installation of dial switching equipment in a basement room?

A. If the basement is dry and there is no danger of flooding, this location should prove satisfactory. Modern dehumidification equipment may be used to reduce the moisture content of the air to a safe level.

Basement locations are generally free of dust which is always an advantage in any telephone exchange.

• • •

Q. Can you tell us why the phantom circuit is not more generally used on open wire lines at the present time? Doesn't it prove a real economy?

A. While it is true that a phantom circuit does effect an economy in that it provides three metallic circuits from two pairs of wires, it is likewise true that it also requires special maintenance. The phantom circuit will be noisy unless the two physical circuits are carefully balanced.

To accomplish this, the circuits must be carefully and properly balanced. The line must also be well insulated which means that tree clearance must be carefully maintained at all times and that broken insulators should be promptly replaced. High resistance joints cannot be tolerated in the physical circuits as they cause an unbalance.

Added to all of this, power lines through the country have in many cases caused serious noise interference with open wire phantom circuits.

Modern, reasonably priced carrier systems have proved more economical and have successfully replaced phantom circuits in many cases.

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Rigid Tests Guard Monophone's High Performance Standards

"Why, it sounds so real you can almost feel the breath of the person speaking to you!" Heart-warming remarks like this are to be expected when you start using Type 40 Monophones. Type 40's deserve such praise because their superior standards are maintained by constant tests.

In the picture above, for example, a technician is testing Monophone receiver capsules for fidelity of response. He impresses a standard fluctuating sound on the receiver, then makes sure that its response produces a designated wave pattern on an oscilloscope. This particular pattern indicates that the receiver will reproduce speech with the high fidelity that is required of a Monophone. It's the pattern for *perfection in transmission!*

Many other tests are also made on Type 40 Monophones, from raw materials to finished product. And Type 40's *design* enters the picture, too—for here is an instrument designed with fine transmission foremost in mind. That's why so many telephone men like it.

Order a supply of Type 40's today. You'll like them—and so will your subscribers!

Maintenance Testing Equipment

By JOHN A. BRACKEN

IN PRECEDING articles, relays are divided into two principal classes: (a) Electronic and (b) electromagnetic. Relative to relays of the electromagnetic type, there are several factors affecting their operation which should be considered; these are:

(1) Relay design.
(2) Construction.
(3) Adjustment.
(4) Magnetic leakage.
(5) Inertia of moving parts.
(6) Effect of any resistor, capacitor, inductance, or any other electrical conductor connected in series with or across the relay winding.
(7) Magnitude of any electrical or magnetic counter forces in the relay winding, such as self-induction.
(8) Condition of the contacts, especially as a result of arcing between the contact points.
(9) Operating current values.

Referring to item "7" above, self-induction is defined as that phenomenon whereby a change in the current flowing in a conductor induces an electromotive force (EMF) in it, due to the cutting of the lines of magnetic force set up by the current. Therefore, when current starts to flow in a relay winding, the rapidly spreading magnetic field of each successive ampere-turn cuts other turns of the same winding, inducing therein a momentary inverse EMF, called the counter EMF of self-induction. This opposes the applied relay operating EMF. Consequently, a brief interval of time elapses before the current flowing reaches its normal value.

When the relay circuit is opened, the lines of magnetic force in the winding suddenly change, and in changing induce a momentary current which flows in the same direction as the applied EMF. This action tends to prolong the flow of current in the circuit.

When alternating current is applied to a circuit equipped with electromagnetic relays, the effect of self-induction is somewhat peculiar*(see Fig. 1)*. This circuit contains a solenoid type relay with a moveable iron core "C," two keys, "K 1" and "K 2," a lamp "L" and a source of alternating and direct current.

PART 69. The preceding article in this series appeared in the Jan. 2 issue, page 26.

In this arrangement, the position of the keys is normal and direct current from the battery passes through the solenoid and lamp, lighting it. When key "K 1" is operated, it will short circuit the solenoid. However, if the solenoid resistance is low, the short circuit will not greatly affect the lamp's brightness. Neither would the brilliancy of the lamp change if the iron core is fully inserted into the solenoid.

If key "K 1" is held operated and "K 2" is then operated, and alternating current is permitted to flow in the circuit, the brightness of the lamp will remain the same. But if the iron core is withdrawn from the solenoid and key "K 1" released, the behavior of the lamp will be entirely different; that is, the lamp will become dim. This dimming of the lamp is due to the value of the alternating current being reduced, in turn on account of the self-induction of the solenoid.

If the iron core is inserted gradually within the solenoid, the lamp gradually dims, burning dimmest when the core has been pushed in all the way. The reason for this is that the self-induction of the solenoid is increased when the iron core is inserted, because the core reduces the magnetic reluctance through which the lines of force travel, thereby increasing the magnetic field.

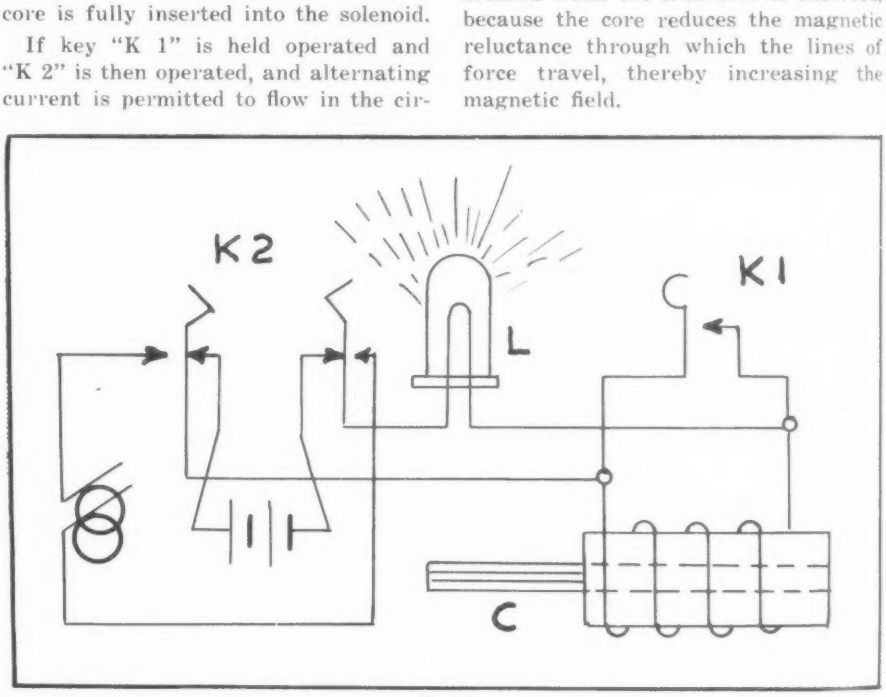


Fig. 1

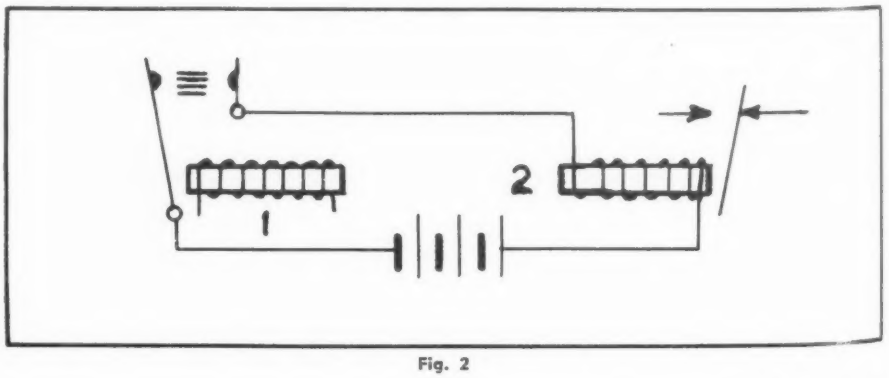


Fig. 2

Similarly, self-induction may be used to regulate the current flowing in an ac circuit, in much the same way a rheostat does when connected in series with any apparatus in a dc circuit. An advantage of applying the self-induction current flow regulation principle in an ac circuit, is that, with such a device, practically no energy is expended, compared to the energy dissipated in heat when a rheostat is used. The opposition encountered by the alternating current is due to counter EMF only.

Regarding item "8," it may be said that when a relay circuit is broken, the existence of self-induction is clearly indicated by the arc obtained at the point of breaking the circuit. This is shown in *Fig. 2*, where the circuit to the winding of relay 2 is opened at the contacts of relay 1. The arc produced is due to the high EMF of the induced current in relay 2, which increases the value of the operating current just at the moment when the latter ceases. There is no arc at the closing of relay 1 contacts, because the induced current of relay 2 is opposed by the operating current and is therefore weaker than in the former case.

Inasmuch as the arc due to self-induction at the point of breaking the circuit to a relay winding is liable to cause serious trouble, care should be taken to reduce the arcing to a minimum.

One way of accomplishing this is by designing the relay so its self-induction will be as small as possible. Another method of neutralizing the detrimental effects of arcing is to connect a capacitor or a non-inductive resistance either across the relay winding, or in parallel with the control relay contacts.

For example, the electrical energy due to opening the circuit which would otherwise be dissipated as an arc between the relay contacts, is diverted through the resistance "R" in *Fig. 3*.

When the circuit is opened to the winding of relay 2 in *Fig. 3*, the energy due to self-induction passes through the non-inductive resistor "R," resulting in no arc at relay 1 contacts. But since the induced current flowing through the resistor "R" continues after the circuit is opened, it requires more time for relay 2 to release than it would if the resistor "R" were not provided.

When the circuit to relay 2, in *Fig. 4*, is opened at relay 1 contacts, the charge stored in the capacitor connected across the winding of relay 2 discharges in the same direction as the current flowing in relay 2 winding, due to self-induction. However, the EMF

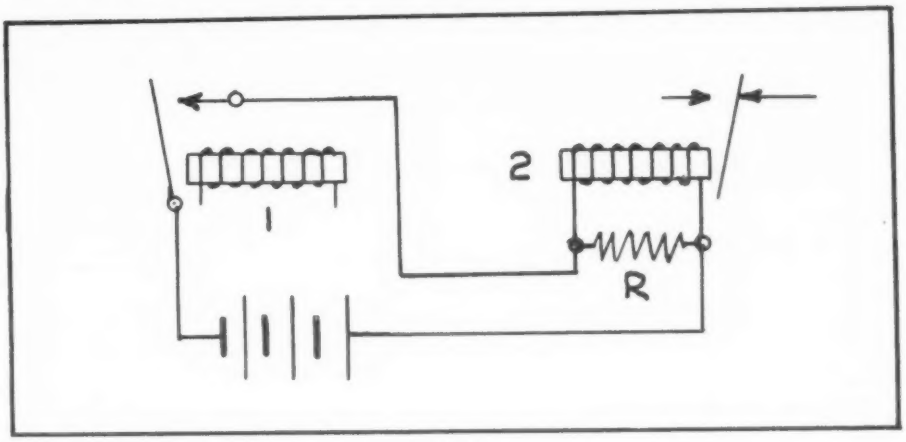


Fig. 3

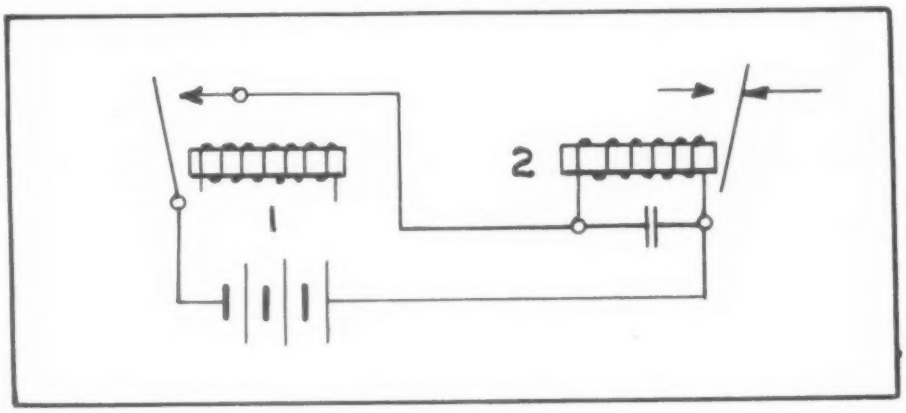


Fig. 4

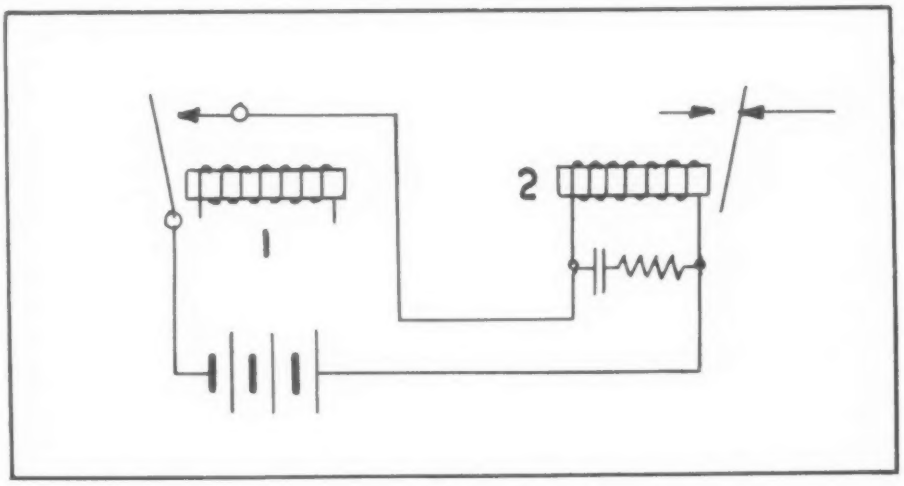


Fig. 5

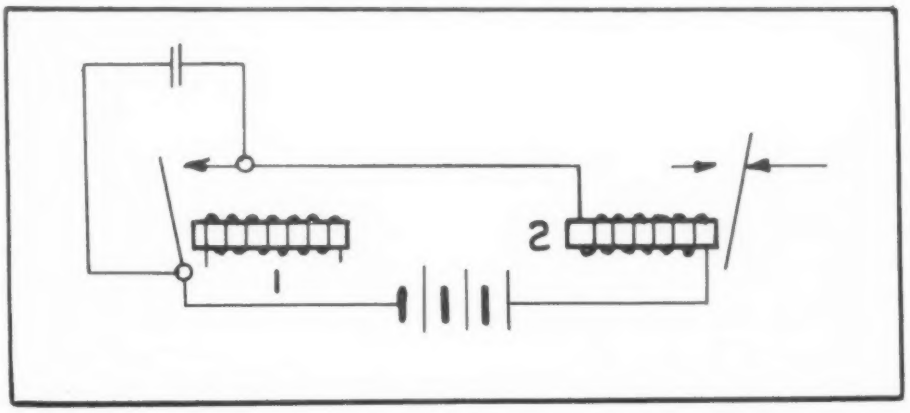


Fig. 6

induced in relay 2, keeps the current flowing after the capacitor is discharged, and the capacitor becomes charged in the opposite direction.

As soon as the induced EMF in relay 2 drops to the EMF of the capacitor, the current flow ceases, and the capacitor starts to discharge through the relay winding. This flow of current through the capacitor, first in one direction and then the other, continues until the induced energy stored in the capacitor and relay winding have been consumed, thus reducing the arc at relay 1 contact points.

A mechanical analogy of this oscillatory flow of current in the capacitor is shown in *Fig. 9*. Here a steel spring is clamped in a vise. When the spring is pulled over to one side and then released with a snap, it will vibrate.

At the start, the vibrations will be over a comparatively long range, but as time goes on (fractions of a second), the range of vibration becomes less and less until the spring finally comes to rest.

By including a non-inductive resistance in series with the capacitor and both bridged across relay 2 winding, as shown in *Fig. 5*, the arcing tendency at relay 1 contacts may be further reduced.

Under certain operating conditions, connecting a capacitor across the winding of a relay may have an undesirable effect of tending to speed up the relay's operation. Therefore, a more favorable method is to connect a capacitor or a resistor in parallel with the control relay as shown in *Figs. 6* and *7*.

Of the two methods, the capacitor method *(Fig. 6)* is considered more suitable than the resistor *(Fig. 7)*, because the resistor provides a path for current flow after the control relay contact points are completely open.

In *Fig. 6* the capacitor acts as a reservoir to absorb the current surge between the control relay 1 contacts, thus instantly breaking the controlled relay 2 circuit by eliminating the arc. After the break, the capacitor discharges itself back through the battery and relay 2 winding. This action of the capacitor tends to demagnetize the relay core more rapidly than otherwise, thereby hastening the release of the relay 2 armature.

In practice, where a capacitor is used, it usually has a non-inductive resistor in series as shown in *Fig. 8*, its purpose being to cause the arcing to extinguish itself rapidly by diminishing oscillatory effects in the capacitor.

(To be continued)

Elementary Electricity and Magnetism Quiz

[AUTHOR'S NOTE: *In previous articles of the "Maintenance Testing Equipment" series, the principles of electricity and magnetism were introduced. With a view to stimulating further interest in the subject, questions have been prepared for inclusion at the end of this and other articles of the series. Some of the questions will in-*

(Please turn to page 42)

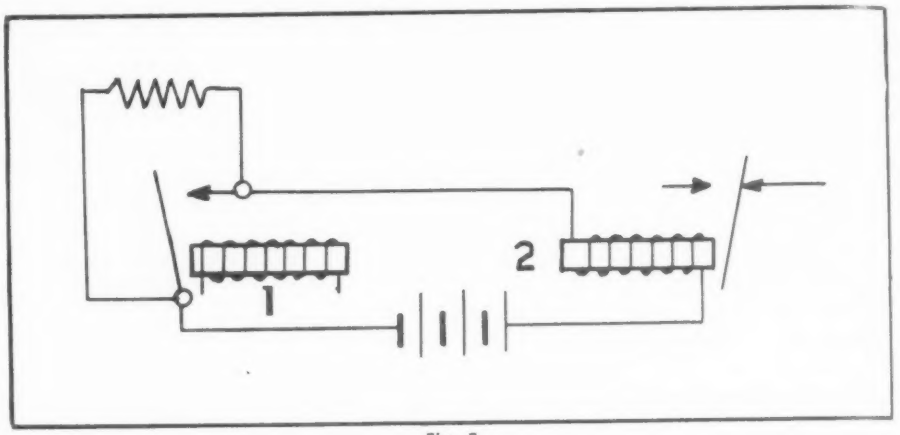


Fig. 7

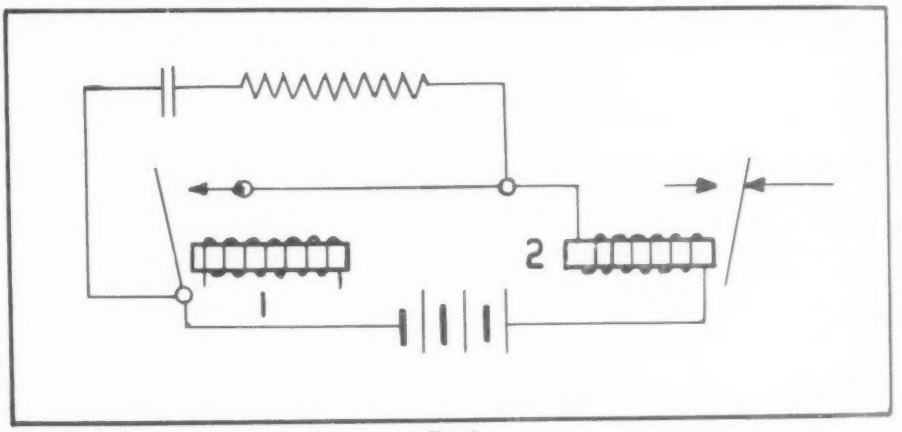


Fig. 8

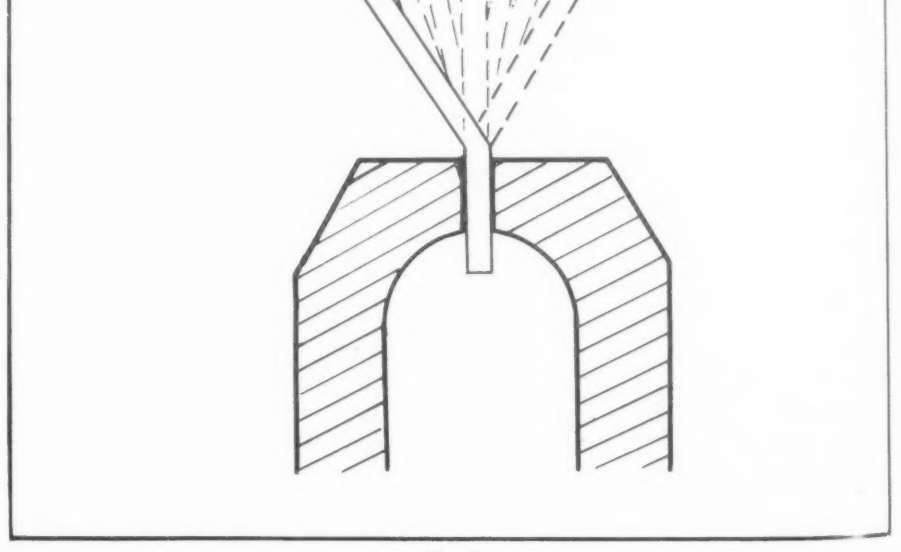
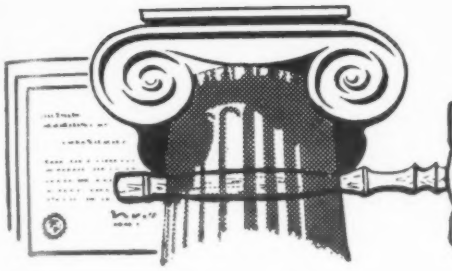


Fig. 9



Courts and Commissions

City in Texas Takes SW Bell To Court in Tax Dispute

Southwestern Bell Telephone Co. was named defendant in a $1,654,109.96 delinquent-tax suit filed Jan. 4 in behalf of the city of Houston and the Houston Independent School District.

The action continued a dispute between the city and Southwestern Bell which began in 1953 when the city council, after a three-month hearing, rejected a request for rate increases averaging 44 per cent.

Company officials offered to pay more than $900,000 of the tax bill, which they claim to be $700,000 too high, but City Treasurer Fred Ankenman declined to accept the payment.

The suit brought criticism from several city councilmen, who said the action is discriminatory and could wreck the city's tax structure. They said the city should have negotiated a tax settlement with the company.

The city council upheld the appraisement board's order setting the tax at $1,654,109.96.

After the 44 per cent rate increases were rejected, the company obtained a temporary injunction setting aside the city's telephone rate ordinance, then posted increases averaging 34 per cent. District court trial of the suit was set for Jan. 18.

V V

New England T&T in N.H. Granted $800,000 of Increase Sought

The New England Telephone & Telegraph Co. has been authorized to increase its rates in New Hampshire by $800,000 a year (TELEPHONY, Nov. 28, p. 34). The New Hampshire Public Utilities Commission issued the consent on Jan. 6, and the new rates will take effect as soon as the company files them. The increase is $196,400 less than the amount sought by the company.

Deputy Attorney-General Warren Waters recommended the increase, and it was not contested by the company's counsel. Several weeks of private discussion preceded the settlement and the point was made that this procedure saved the cost of possible lengthy litigation. Waters said that the $800,000 increase would yield a 6 per cent on the rate base, this rate of return having been previously authorized by the commission in the proceedings.

The increase covers the two wage increases granted by the company since mid-1952. Waters stated that he did not agree with the company in allowing for plant equipment now being installed, because it is not yet in actual service. He also reduced the amount allowed for advertising expenses in 1953 by $30,000, because the total amount was much higher than the average of previous years, and according to Waters was not likely to recur. He noted that the company will get but $380,100 out of the $800,000 gross. The rest will go into federal income taxes and payment for AT&T contract services at the rate of 1 per cent of gross revenue. Company counsel regretted the position taken by Waters on plant investment, but announced that it would not be contested.

The company filed for the latest increase in rates on Nov. 6, 1953, on the ground it was not earning the rate of return established by the board's finding of September, 1952. In that case, the company received $350,318 of the $1,638,000 which it sought. As a result of that decision, later sustained by the New Hampshire Supreme Court on June 2, 1953, the company had to refund over one million dollars to its subscribers. The rate of return, established in the previous case, between 5.75 and 6 per cent, was not an issue in the case just settled.

The Jan. 6 order of the commission was signed by the full board.

V V

Foresee Deficit from Schedule Of Rates Granted in Minnesota

The Minnesota Railroad & Warehouse Commission on Dec. 29, 1953, approved a schedule of dial service rates for the Wright Telephone Exchange which, it was estimated, still would leave an operating deficit.

It was noted by the commission that O. L. Johnson, purchaser of the Wright company in June, 1952, has improved and extended service and plans to cut over the exchange to dial operation. The rates authorized upon conversion to dial would produce revenues of $5,350, but an operating deficit of $110. Plant original cost will be $37,140. The following are the approved dial rates:

One-party business	$4.00
Four-party business	3.50
Rural Multi-party business	3.25
One-party residence	3.00
Eight-party residence (town)	2.50
Rural multi-party residence	2.50

Forty-five local and 80 rural subscribers are served by the Wright company.

V V

General of Pennsylvania Files for Rate Increases

General Telephone Co. of Pennsylvania, Erie, on Jan. 1 filed new rate schedules with the Pennsylvania Public Utility Commission that would increase annual gross revenues by $1,548,600.

Lewis F. Shepherd, president of the company, cited rising costs resulting in a steady decline in earnings during the past year as the reason for the company's applying for increased rates. He pointed out the company had been granted only two general increases in rates in the last 25 years, and at some of the exchanges the rates for certain classes of service had been increased only once in 25 years.

"Under present rates, earnings of the company have been decreasing because operating expenses have continued to rise faster than revenues. Like any other business, the telephone company must have adequate earnings to do a good job," Mr. Shepherd said. The increase represents approximately 15.7 per cent of the current revenue. A little more than one-half of this amount will go for federal and state taxes.

"One of the principal factors contributing to rising costs has been increased wages," Mr. Shepherd pointed out. "The increases in basic wage rates, plus shortening of wage progression schedules, improved vacation, holiday pay, and other fringe provisions, for the past two years is equivalent to an increase of more than 22 cents per hour. We have also been hit by rising costs for the materials and equipment that are necessary to maintain service. Taxes for last year amounted to $1,-

214,000, more than three and one-half times the taxes paid before the war."

"Since the war," Mr. Shepherd said, "General Telephone Co. of Pennsylvania has accomplished a very extensive building and expansion program. More than $23,700,000 of new plant consisting of additional central office buildings, equipment, outside plant, and telephone instruments have been placed in service."

V V

Northwestern Bell Authorized Rate Increase in Minnesota

The Minnesota Railroad & Warehouse Commission on Jan. 8 authorized increases in Northwestern Bell Telephone Co. exchange and toll rates. New exchange rates are to become effective on billing dates starting Feb. 1. New toll rates, involving distances up to 93 miles, are effective Feb. 1.

The new rates, according to the commission, will produce $3,405,000 annually in additional gross revenues or $1,467,000 after taxes. The increase amounts to 87 per cent of the amount requested by the Northwestern company in its application filed with the commission on Oct. 14, 1953.

The Minnesota commission also ordered Northwestern Bell to proceed with plans to terminate the present toll charge between Minneapolis and St. Paul and to introduce a new plan for expansion and improvement in service for the Twin Cities to become effective not later than Dec. 31, 1954.

In its order, the commission pointed out "that the company's earnings will fall below the rate deemed necessary . . . unless some consideration is given to the increased investment made by the company during the period in which the prescribed rates are to be in effect. . . . If the company is to earn at the rate of return found reasonable herein, due allowance must be made for the effect of large scale construction on its rate of earnings."

V V

Mountain States T&T Applies For Fair Return in Arizona

The Mountain States Telephone & Telegraph Co. recently asked for a rate increase in Arizona, leaving the amount up to the Arizona Corporation Commission.

The commission was asked, in the company petition, to decide "what additional revenues are needed to provide a fair and adequate return."

Mountain States informed the commission that its earnings had "deteriorated to a dangerously low level," since present rates are being based "on conditions as they existed about three years ago."

Harold K. Richmond, Mountain States district manager, said that two years ago the commission granted rate increases that brought a return on the investment of approximately 5.8 per cent. Those rates went into effect in January, 1952.

Mr. Richmond said that since the company last appealed to the commission for an increased rate base, Mountain States has invested 32 million dollars in Arizona telephone facilities and has granted two wage increases. He added that the company plans to spend 12 million dollars on facilities in the state in 1954.

Inflation and increased taxes have brought the rate of return on the company's investment to the point where it is difficult to attract investment capital, the company informed the commission.

V V

Wisconsin Companies' Rate Raise, Purchase Applications

The Wisconsin Public Service Commission has received the application of the Wisconsin Telephone Co. to buy the properties of the Vandyne Telephone Co.; a Jan. 20 hearing was scheduled on the petition.

The commission also scheduled a Jan. 21 hearing on the application of the Hazel Green Telephone Co. for authority to increase its rates.

V V

Mexican Company Will Offer Stock to Public for First Time

It was reported on Jan. 14 that in order to raise funds urgently needed for expansion, Telefonos de Mexico, S.A., will offer stock for sale to the public this year for the first time.

The company also plans to borrow 70 million pesos ($8,130,000) from the government financing bureau.

A total of 220,000 shares of stock will be offered at 100 pesos ($11.63) each to raise 22 million pesos ($2,550,000).

V V

24 Per Cent Rate Increase Given Maine Independent

A rate increase of about 24 per cent was given the Saco River Telephone & Telegraph Co. by the Maine Public Utilities Commission recently. But the commission stipulated that the increase should not apply on lines serving 11 or more subscribers.

The company stated in a public hearing in October that it had lost about $2,000 in the first six months of 1953. The proposed increase would be little more than the current net loss, the commission said. The new rates will take effect after a revised schedule is filed. The commission noted that a "considerable number of people" opposed a raise, at least until service is "drastically improved."

V V

Pennsylvania Independent Given $144,700-A-Year Rate Raise

The Pennsylvania Public Utility Commission recently authorized the Meadville Telephone Co. to increase its rates by $144,700 a year, effective Jan. 1 (TELEPHONY, Jan. 2, p. 30).

At the same time, the company was ordered to eliminate what the commission termed "inequities" in its rate structure. These, the commission explained, were certain charges among the company's 15,000 subscribers in Crawford, Erie, Mercer and Venango counties; to correct them the commission adopted a company proposal under which five local service rate classifications were replaced by three in the above localities.

The rates under the above new classification are as follows:

Spartansburg:

One-party residence	$4.50
Four-party residence	3.25
Multi-party residence	3.25
One-party business	6.00
Two-party business	5.25
Multi-party business	4.50

Fredonia, Sandy Lake, Stoneboro and Sheakleyville:

One-party residence	5.25
Four-party residence	3.60
Multi-party residence	3.60
One-party business	8.00
Two-party business	6.50
Multi-party business	5.50

All other exchanges, including Meadville, Guys Mills and Townville:

One-party residence	5.50
Two-party residence (Meadville only)	4.50
Four-party residence	3.90
Multi-party residence	3.90
One-party business	10.00
Two-party business	8.00
Multi-party business	6.00

In accepting the company's rate schedule, the commission said it "recognizes that the value of service depends on the number of subscribers that can be called without payment of toll charges."

However, wholesale elimination of toll charges in 1951, which resulted in exceptionally broad local service areas, "is questionable," the commission said.

"Very little community of interest exists between certain exchange areas," the commission added, "and we suggest that the company consider the desir-

ability of reducing the size of certain of its local service areas."

At present, all Crawford County exchanges of the Meadville company, except Spartansburg, have free service to one another.

The revised rates will produce a $234,600 annual net income, or 5.4 per cent on the commission's fair value finding of $4,340,000.

V V

Postpone Hearing on N. C. Company's Rate Plea

A hearing on a rate increase request by the Hickory (N. C.) Telephone Co., which was scheduled for Jan. 12 has been postponed until Feb. 18 at the company's request. The postponement was announced the day before the hearing was scheduled to be held.

The Hickory company seeks approval of an increase which would raise its rates an estimated $120,545 a year. It says the increase is needed to offset rising costs and bolster the rate of return on its investment.

The company operates in Hickory, Valdese, Granite Falls and Hildebran, and has greatly expanded service in recent years. It served 8,691 subscribers in 1950 and last summer had a total of 11,532.

V V

Approve Nebraska Company's Preferred Stock Issue

The Nebraska Continental Telephone Co., Columbus, was authorized by the Nebraska Railway Commission on Jan. 12, to create a series of cumulative preferred stock to be designated "Series A," which will consist of 20,000 shares with a par value of $25 per share.

The company has negotiated the sale of the stock at not less than par, together with accrued dividends from the date of issue.

The proceeds from the sale of the stock will be used for the payment and discharge of the company's open account payable to the parent company, Continental Telephone Co., Wilmington, Del., in the amount of $160,000. The balance remaining will be used for the construction, extension and improvement of Nebraska Continental's facilities.

V V

Asks General Rate Raise

The Campbell Telephone Co. filed an application with the Nebraska Railway Commission on Jan. 11 for authority to increase rates for all classes of service. The increases would range from 70 to 90 cents.

Montana District Court Upholds Commission's Rate Grant

A Bozeman district court recently ruled that Montana Attorney General Arnold H. Olsen cannot take it on his own as attorney general to challenge higher telephone rates allowed by the Montana Public Service Commission.

The ruling said the case was the first of its kind in Montana court history.

The opinion means that Olsen could pursue his action as a private individual, as a member, which he is, of the state board of examiners, or if directed by the governor.

The commission authorized Mountain States Telephone & Telegraph Co. to increase its rates on Sept. 1.

District Judge W. W. Lessley of Bozeman upheld Mountain States and the commission in the action.

Attorney General Olsen is the commission's legal counsel but was challenging its rate-granting action.

Judge Lessley ruled: "It is clear to this court that the Montana Public Service Commission's orders and rules may be tested in a proper case. But it appears on the face of the amended complaint that the attorney general is not the real party in interest herein.

"The question presented here by the demurrers, the commission and the company is of the first impression. The weight of authority, however, sustains this order."

V V

Illinois Independent Asks Rate Increases

The National Trail Telephone Co., Altamont, recently applied for rate increases, the Illinois Commerce Commission announced on Jan. 8.

The proposed rates would range from $3.00 for rural multi-party service in the company's Altamont, Beecher City, Brownstown and St. Elmo exchanges, to $5.25 for one-party business service in St. Elmo, $5.00 in Altamont and $4.75 in Brownstown and Beecher City.

J. A. Stice, general manager, said the company received its last rate increase on Mar. 1, 1950.

V V

Uphold Commission's Right to Require Stock Sale Above Par

The right of the North Carolina Utilities Commission to require utility stock to be sold for more than par value was upheld by Superior Court Judge Walter J. Bone on Jan. 12. The Carolina Telephone & Telegraph Co. Tarboro, plaintiff in the case, immediately gave notice of appeal to the North Carolina Supreme Court. (This appeal was filed on Jan. 15 with the supreme court, which scheduled a hearing on it during the week of Feb. 8.)

Judge Bone affirmed an order in which the commission required Carolina Telephone to sell a new stock issue at a price more than the company proposed. The company had objected to the commission order contending the commission had no right to set the stock price and that in attempting to do so, it was usurping a function of company management.

The issue arose recently when the company asked commission authority to issue 33,320 shares of additional common stock, which would be distributed among its present shareholders at par value of $100, at a rate of 1-for-5.

The commission approved the new stock issue and the shareholders' 1-for-5 allotment. But it held that, since the company needs the extra money and the stock is worth considerably more than par on the current market, the price for the new issue should be set at not less than $115 per share.

The company did not question the $115 value placed on the stock, but protested that the commission usurped a company function in setting the price, and that it lacked authority under the statutes to set a sales price greater than par.

The commission rejected Carolina Telephone's plea for reconsideration of the issue. The commission stated that in its opinion it had authority under the statutes to act as it had. The company then appealed to superior court.

Carolina Telephone now has in the supreme court an appeal from another of Judge Bone's decisions, upholding a commission order authorizing the company to increase its exchange rates and charges an estimated $537,000 more a year. The company contends the amount granted was inadequate; and the state's attorney general, representing the public, and attorneys for several municipalities served by the company also have appealed the order, on the contention that no increase at all was justified (TELEPHONY, Jan. 2, p. 28).

V V

Sell Arkansas Independent, Plan to Expand Another

It was recently reported that the Elkins (Ark.) Telephone Co. was sold by Mr. and Mrs. Oley Draves to Mrs. Ida Disney and family, of Elkins. They were to have taken over officially on Dec. 31.

The Draves, who purchased the

(Please turn to page 40)

The Da
TRANSISTORS ARE BIGGER NEWS THAN EVER
As telephone people hear increasing talk of the wonderful **Transistor,** they can be proud that it was their business that brought it into being. Invented by telephone scientists for telephone use, **Transistors** serve in many other fields and have become big news to both science and the general public. The advertisement across the page tells millions of readers of January magazines about the **Transistor's** development, and its progress.

THAT'S A TRANSISTOR. *invented at Bell Telephone Laboratories.* This tiny electronic device can do many things that vacuum tubes can do and more besides. Though little larger than a coffee bean, it can amplify electric signals 100,000 times.

She's Holding a Five-year-old Granddaddy

The ***Transistor*** was announced only five years ago but it is already the daddy and granddaddy of many promising offspring. All of the growing uses of this tiny electronic device stem from its invention at Bell Telephone Laboratories.

Seldom has there been an invention with such exciting possibilities in telephony and in other fields. A recent issue of *The Reader's Digest* calls it "The Fabulous Midget" and reprints these words from an article in the *Science News Letter:* "In less than half a century, the electronic tube has changed the world. The effect of the transistor on our lives may be equally potent."

The Bell System, in accordance with its established policy of making all of its inventions available to others on reasonable terms, has licensed forty companies to make and sell transistors. These include makers of advanced equipment for defense, as well as radios, television sets, computing machines, hearing aids and electronic apparatus.

One of the first uses of the ***Transistor*** in telephony was in the new electronic equipment which enables telephone customers to dial Long Distance calls from coast to coast.

We can already see the time when it will bring many other improvements in both Local and Long Distance service.

BELL TELEPHONE SYSTEM

LOCAL . . . *TO SERVE THE COMMUNITY.*
NATIONWIDE . . . *TO SERVE THE NATION.*

Your Association's Invaluable; Here's How It Works

THE TIME for another round of state conventions is fast approaching. We wonder if all telephone people realize what, and how much their state associations do for our industry, particularly for operating companies.

A résumé of an association's activities recently appeared in the Ohio Independent Telephone Association's bulletin, *The Independent Call.* The story was titled "What Your Trade Association Can Do For You" and we take pride in reprinting it here:

"Membership in the Ohio Independent Telephone Association (OITA) brings many benefits to the individual member and to the telephone industry as a whole. The Ohio Independent Telephone Association can do you still more good if every member will use its services fully. All too frequently, association members have only a partial idea of what their organization can do, or is doing for them.

"Our trade organization is a non-profit association of Independent telephone companies, formed to provide specific services. You, as a member, can be helped by our ten basic services at an investment of less than one per cent of your company's annual income. These ten major services are:

"What WE Do

(1) "Up-to-the-minute information on Independent telephone facts and problems.
(2) Annual convention and district meetings where you can exchange know-how and fellowship with other members.
(3) An active program of governmental relations and legislative research.
(4) Studies of trade practices and business ethics.
(5) A continuing, state-wide public relations program that builds good will and economic understanding.
(6) Joint promotion of this industry's many services.
(7) Furnishing legal advice on broad industry problems.
(8) Statistics and economic planning.
(9) Educational progress with schools and colleges.
(10) Inter-industry activities such as working with other trade groups.

"The major benefit of OITA membership is probably the pooling of know-how. Independent telephone executives have learned that by helping each other they help themselves. Co-operation through a trade association pays.

"Take, for example, governmental relations. A few of the large companies are able to hire representatives to interpret the latest revisions in the Ohio General Code and public utility commission orders. Most small and middle-size companies just cannot afford to do this. But each can afford membership in OITA and an important job of this association is to provide just such services. Especially important is to take your problems to your association. Your difficulty may not be as unusual as you think, and your association may have already helped work out a solution to the same problem for another company.

"How can you judge the value of your investment in OITA? Take the list of current activities and programs that we are now conducting. Then estimate what it would cost you to handle a similar program on your own. Then compare it with the cost of dues and time spent on association activities. Of course, some projects couldn't be tackled by an individual telephone company—some wouldn't be desirable, and others can't be measured for cost. But even a rough comparison will give you a good idea of the value of your membership.

"Your trade association is unusually well situated to cope with problems in the public relations area. Few Independent telephone companies can afford to keep tab on all proposed legislation that might have impact on our business, or hope to change people's attitudes singlehandedly.

"Are you getting the most from your dues dollars? Check yourself on these seven points.

"What YOU Should Do

(1) "Learn your association's program.
(2) Attend its state and district meetings.
(3) Have members of your company participate in such meetings.
(4) Read and study OITA's publications.
(5) Keep your inter-company relations strong.
(6) Volunteer personnel from your company to serve your association's committees.
(7) Be prompt in payment of your association dues.

"I SEE JOHNSON'S HAD ANOTHER TIFF WITH THE TELEPHONE COMPANY."

"If things don't suit you, don't threaten to resign. Instead, let us know how association headquarters can be more helpful. Dr. Julius Cline, former Assistant Secretary of Commerce put it this way: 'I can think of nothing more dangerously extravagant than resigning from a trade association. It is a wasteful squandering of that invaluable asset of good teamwork at the very time when collaboration is absolutely vital. When you are out in the mid-Atlantic in a bad storm, do you see anybody shoving off from the big liner in a rowboat by himself, to save passage money?'

"Briefly, it all boils down to this: To get full benefit, use your association, support it with your time, money and talents.

"It's as true as it is trite: In UNION THERE IS STRENGTH!"

V V

Six More TV Stations Added To Bell System Facilities

Six television stations were connected to the Bell Telephone System's nationwide network of television facilities between Christmas and the New Year.

They were KOA-TV, Denver, Colo.; WROL-TV, and WTSK-TV, Knoxville, Tenn.; WOSH, Oshkosh, Wis.; WSTV, Steubenville, O.; and WAYS-TV, Charlotte, N. C. The Knoxville, Oshkosh and Steubenville stations were the first to be connected for network service in their respective cities, KOA was Denver's fourth, and WAYS-TV was the second station in Charlotte to receive network service.

An announcement by the Long Lines Department of the American Telephone & Telegraph Co. said network programs for the two Knoxville stations are fed over intercity facilities from Atlanta via Chattanooga, Tenn., while programs for WSTV, Steubenville, are fed over the Pittsburgh-St. Louis radio-relay system. Network programs are fed to WOSH-TV, Oshkosh, from the Milwaukee-Green Bay, Wis., radio-relay system; a newly constructed microwave link carries the programs from this system to the station's studio-transmitter site. The job was a joint undertaking of the Wisconsin Telephone Co. and Long Lines.

Network programs for WAYS-TV can be fed over intercity facilities from either Washington, D. C. or Atlanta, Ga. The local channel from the telephone building to the station's studio was provided by the Southern Bell Telephone & Telegraph Co., Long Lines said.

According to this latest Long Lines announcement, network television service is now available to 261 stations in 161 cities in the United States.

IN THE NATION'S CAPITAL

Continued from page 18

of Ralph Waldo Emerson's daughters, and engaging in such polite country squire pursuits as raising blooded horses and Concord grapes.

At this point in his life, Forbes literally risked his entire stake on the success of a sensational laboratory experiment of an obscure Scotch teacher of elocution, Dr. Alexander Graham Bell.

It was in 1878, just two years after Bell had patented his telephone, that the Bell Telephone Co. was organized. One year later, Forbes became president and threw himself into the task of remedying its manifest deficiencies; the threat of patent invasion from the rival Western Union Telegraph Co. (controlled by the Vanderbilts); inadequate financing; and little or no managerial system or orderly organization. In fact, the original Bell company had to be reorganized under Forbes with a total capitalization of less than a million dollars.

Forbes needed an ally in these days of high-handed post-bellum financial buccaneering. He found one in the Gould interests which controlled the rival American Union Telegraph Co., which was trying to build its own telegraph system to stymie Vanderbilt.

For eight years, Bell's telephone was the pawn and poor relation of quarrelling telegraph interests. It followed a hazardous course under the skillful and resourceful financial direction of Forbes. By 1885, the Bell enterprise was established beyond real danger of overthrow or reprisal. It had woven its own system of lines throughout New England and the East and was steadily infiltrating the West and Middle West. In that year, the American Telephone & Telegraph Co. was organized. Two years later Forbes retired from active control. He died in 1896 at the comparatively early age of 55.

The author has written a very gracious memoir of Forbes. But there are a lot of blank spaces. The reader gets only a shadowy picture of the dominating personality of Theodore Vail, who was to succeed Forbes and play such a long and important part in molding the Bell system. On the cultural side, there are many things which the author might have filled in about Forbes' illustrious in-laws, the Emersons, and his relations with Bell himself. On the philosophical side, Pier's biography is likewise scanty. How could Forbes, with the same background and temperament as his contemporary, Henry Adams, embrace so enthusiastically a lusty, growing Amer-

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ica which the other proper Bostonians merely tolerated?

One feels the author might have told us more along these lines, that his notes and research could have spelled out a riper picture of the full life of William Forbes than this slender volume. But even so, it is a welcome contribution to the saga of the telephone industry. The many facets of Forbes — banker, railroad tycoon, telephone industry pioneer, as well as country gentleman and intimate of the inner intellectual circles of New England during its finest flower—would seem to merit a more detailed and spacious setting in the showcase of American biographies of that period. Yet, within the author's own set limits, it is a very worthwhile volume.

COURTS AND COMMISSIONS

Concluded from page 35

Elkins company four years ago, built it up during that time from 97 subscribers to a total of more than 300.

They own and operate the Hindsville Telephone Exchange and plan to expand it.

V V

Texas Independent Granted Rate Increase Authority

The city council of Killeen, Tex., meeting recently in a special session, granted rate increases to the Mid-Tex Telephone Co.

The increase, which was granted by unanimous vote, is as follows:

	Old	*New*
One-party business	$6.50	$8.00
Two-party business	5.50	7.00
One-party residence	3.50	4.50
Two-party residence	3.25	4.00
Four-party residence ...	3.00	3.50

Company officials who met with the council said that the additional revenue would be used to continue expansion and improvement of service, and help to offset the rising costs of material and labor.

V V

Asks Discontinuance O.K.

The Pennsylvania Public Utility Commission was to have held a Jan. 19 hearing on the application of the Penfield Telephone Co. for approval of service discontinuance.

V V

Tennessee Rate Plea

The Tennessee Railroad & Public Utilities Commission has scheduled a Jan. 27 hearing on the application of the Trimble Telephone Co. for an increase in rates.

Wisconsin Independent's Stock Issue O.K.'d

The Cuba City Telephone Exchange Co. recently was authorized by the Wisconsin Public Service Commission to issue 2,650 shares of common stock at $7.50 per share, or a total stock issue of $19,875.

These funds will be used to retire $16,000 of short term notes as well as to finance additions to the company's plant.

V V

Missouri Company Asks Advance Date on Rate Increase

The Missouri Public Service Commission was to have held a Jan. 22 hearing on the motion of the Missouri Telephone Co., Columbia, to advance to Mar. 1 the effective date of its $152,000-a-year rate increase.

The increase is now scheduled by commission order to become effective July 1.

V V

Two Illinois Independents Ask for Rate Raises

The Illinois Commerce Commission scheduled a Jan. 18 hearing on the application of the Looking Glass Prairie Telephone Co., Mascoutah, for authority to increase rates for service in New Baden and vicinity.

The commission also received an application from the Keyesport Telephone Corp. for authority to increase rates.

V V

Increases Capital in Vermont

The Shoreham Telephone Co., Inc., Orwell, under authority of the Vermont Public Service Commission increased its capitalization from $10,000 to $30,000 to finance installation of dial service at its Benson exchange and to make other improvements in its plant. The company serves approximately 413 subscribers.

V V

OBITUARY

WALTER E. TAYLOR, 71, vice president of the Somerset Telephone Co., North Anson, Me., died on Dec. 24 in Norridgewock.

Mr. Taylor, who was serving his second term in the Maine Legislature, was also a partner in the G. S. & F. E. Jewett Canning Co., a director of the Federal Trust Co. in Waterville and chairman of the board of trustees of the Norridgewock Water District.

V V

>> In some countries the charge for a telephone subscription must be paid for a year in advance.

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The base and cover are detachable from the mounting bracket by a bayonet locking arrangement of three Everdur studs that are "upset" to prevent loss of nuts during installation. These nuts fit the standard socket wrench. Wire entrances are sealed by a Neoprene gasket to prevent the entrance of insects, dirt and moisture.

The new Testerm Drop Wire Connector Part No. 563-30 supercedes Part No. 563-1

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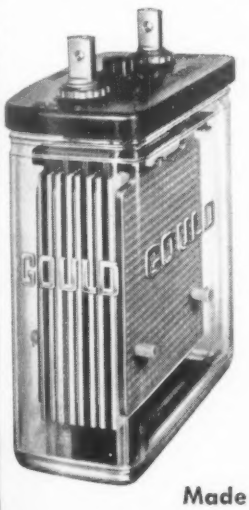

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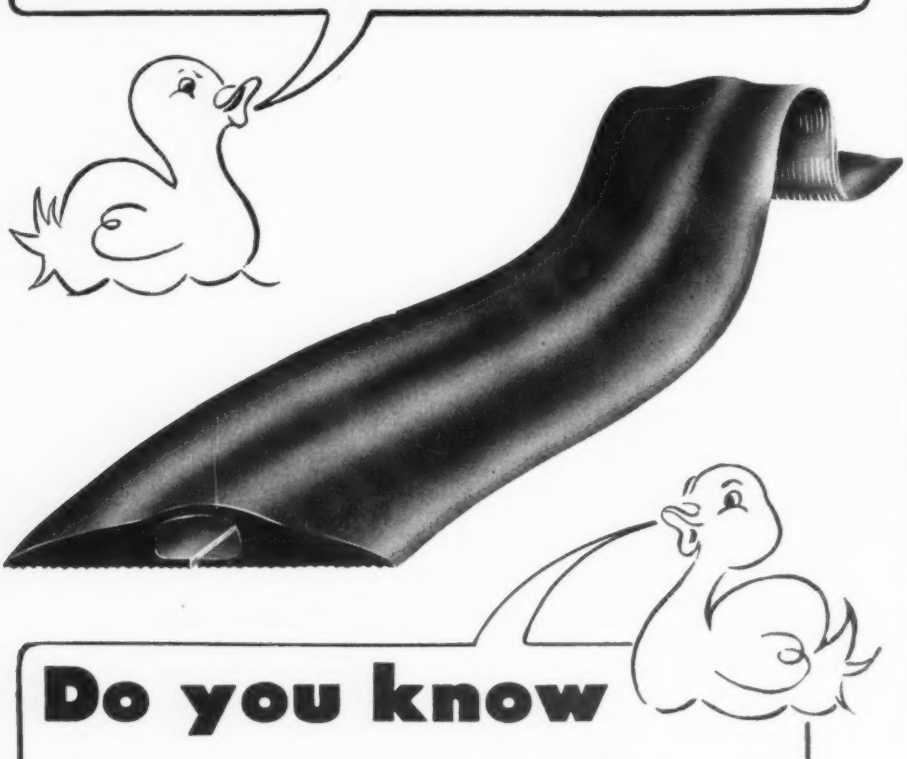

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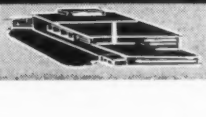
1250 KINNEAR RD.  COLUMBUS 12, OHIO

MAINTENANCE TESTING

Concluded from page 32

volve Ohm's law. No difficulty should be experienced in selecting the right answer to each question. Answers to each set of questions will be given on a different page of the issue in which the questions appear.]

* * *

Below are five questions. Underline the word in parenthesis which you consider the answer to each question.

(1) A natural magnet is composed of (lead) (zinc) (tin) (magnetite) (copper) (iron).

(2) The resistance that air offers to lines of magnetic force is called (retentivity) (polarity) (reluctance) (residual).

(3) A magnet has two poles known as (east) (south) (west) (north).

(4) The ability of a substance to concentrate magnetic lines of force is called (conductivity) (inductance) (permeability) (polarity) (power) (tension).

(5) When a piece of iron is brought near a magnet it becomes a magnet by what is called (force) (attraction) (induction) (saturation).

See correct answers on page 45.

V V

"The philosophy of the present administration is based upon the principle that government should not attempt to do what private enterprise can do."—WALTER WILLIAMS, *Under Secretary of Commerce.*

Answers to Traffic Questions On Page 19

(1) The entry "lw" and the operator number is made on the ticket on a line with the delay report.

(2) All tickets on which word has been left should be sent promptly to the TX position.

(3) The use of this phrase has been discontinued.

(4) Proceed as on a report received over a WH operator trunk, except that it is necessary to use the original ticket, entering "wh (time)" in the space for reports.

(5) Say, "I am sorry but no one seems to be calling you from (calling No.). If I locate a call for you later, I will call you."

Kansas Co-op Tells Purchase Of Independent Company

The Rural Telephone Co., organized as a cooperative to provide dial service to rural subscribers in a six-county Kansas area, has announced the purchase of the Logan (Kan.) Telephone Co., which serves part of Norton, Phillips, Rooks and Graham counties.

Leland Archer, president of the co-op's board of directors, said the exchange was purchased from Lee Traver of Logan. Exchanges at Damar, Edmond and Densmore already have been purchased, including Sheridan and Decatur counties in the area to be served.

Mr. Archer said that as soon as the Logan exchange area is mapped the company will apply to the Kansas Corporation Commission for a charter.

It was recently reported that a loan of $602,000 from the REA has been approved to start modernization of lines and installations for subscribers. Preliminary organization was started about three years ago. There are now approximately 700 applications for service.

V V

General of California to Spend $41,000,000 on New Equipment

Total expenditures in excess of 41 million dollars will be made for new equipment and facilities by the General Telephone Co. of California, Santa Monica, in 1954, according to E. M. Blakeslee, company president.

The 1954 program is by far the most extensive undertaking by the company in a single year and includes estimated expenditures of over 15 million dollars for dial office switching equipment and 10 million dollars for cable and wire plant extensions and replacements. Two of the company's principal Los Angeles metropolitan exchanges are now being converted to automatic toll ticketing operation which, when completed in 1955, will enable customers to dial directly most telephones in the Los Angeles area.

General of California is one of the fastest growing telephone companies in the nation. Since 1947 it has more than doubled the number of telephones it operates. The company now has 570,000 telephones and a plant valued at over 160 million dollars or nearly five times its 1947 investment.

V V

"In addition to being the most richly productive, America's economic system does a better job of 'sharing the wealth' produced than any other system the world has ever tried."—Bassett (Neb.) *Leader*.

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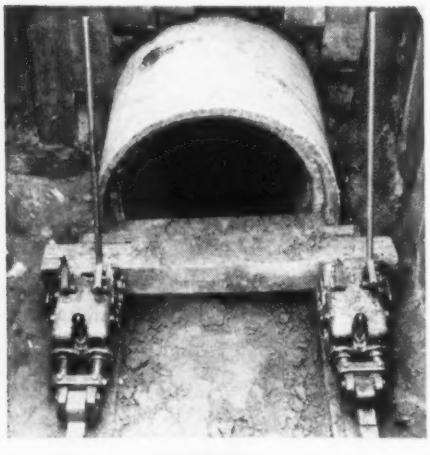

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REA Reports 1953 Progress in Rural Telephone Field

The Department of Agriculture on Jan. 8 released a report of the 1953 activities of the Rural Electrification Administration in the rural telephone field.

Ancher Nelsen, REA Administrator, reported that 30,000 rural subscribers on 126 exchanges received modern dial telephone service during 1953 as the result of REA financing. Forty-five modernized telephone systems were put into service, twice as many as were completed during the first three years of the new program. These systems were introduced during the year in Alabama, Florida, Kentucky, Michigan, New Jersey, North Dakota, Oklahoma, Utah and Wisconsin. More than half of the states now have rural telephone facilities financed by REA. Minnesota leads with eight REA-financed systems, followed by Texas with seven. Louisiana and South Carolina each have six of these systems in service.

REA approved telephone loans in the amount of 49 million dollars in 1953, about 6 million dollars under the amount approved during the previous year. However, the advance of funds on loans was nearly doubled—from 15 million dollars in 1952 to 26 million dollars in the year just ended. Mr. Nelsen said this indicates a substantial speed-up of telephone construction activities. One of his first official acts after taking office in April of last year was to reorganize the REA staff so as to give more attention to the telephone program.

"Despite this gratifying progress, serious problems confront some of the rural electric systems," Mr. Nelsen said. "Such problems as power supply and mounting debt payments to the government will require the best efforts of all of us to continue the program on a sound and economical basis."

With reference to the telephone program, Mr. Nelsen said he believed that "good progress was made during the year toward a workable program." He said that the "ground work has been laid to obtain the cooperation of farm people, the existing telephone industry and the government in the job of providing adequate rural service at the least cost to the subscriber and the taxpayer."

V V

National Engineering Societies Receive Bids for Headquarters

Representatives of the Chicago area are among those of various United States cities strongly bidding for the establishment of the new headquarters of the major national engineering societies. Other contenders are Cleveland, New York City, Pittsburgh and Washington, D. C., it is reported.

The major national engineering societies are now headquartered in their own building, built in 1906, in New York City. The societies have decided that a new headquarters must be built —to provide larger and more modern facilities and in a better location.

Title to the present headquarters is vested in a group, known as the United Engineering Trustees Inc., which is made up of representatives of the four "founding" (because they are the oldest) engineering societies: American Society of Civil Engineers, American Institute of Electrical Engineers, American Society of Mechanical Engineers and the American Institute of Mining and Metallurgical Engineers.

Also a tenant in the present headquarters is the Society of Automotive Engineers. More national engineering societies would probably be housed in the headquarters building if it contained enough space. It is planned that the new headquarters will contain more space that it might accommodate more. It is reported that the American Society of Chemical Engineers is aggressively interested in becoming located in the new headquarters, too.

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BOOK REVIEW

"HOW TO GET MORE BUSINESS BY TELEPHONE," by Jack Schwartz, 256 pages, illustrated. Price $4.85.

With 50 million telephones now in use in the U.S., sales transactions over the telephone have grown remarkably in recent years, as this book demonstrates. This is largely because of new standards and codes of salesmanship courtesy conduct and development of fast techniques of service. Mrs. Consumer as well as big industrialist buyers transact a high percentage of this business by telephone.

According to the publisher, this book gives the know-how, the standards of successful selling procedure which enables trained telephone salesmen to say (as does Author Schwartz, who has sold 6 million dollars worth of insurance in the past eight years, solely by telephone), "Everytime I lift the receiver off the hook I earn $5.60."

The book is concrete and practical, giving detailed examples and methods for successful selling by telephone of department store goods, groceries, insurance, real estate, electrical appliances and household goods, industrial goods, even professional services.

Instructions are detailed and authoritative. The new methods of "sales approach" by telephone, for securing appointments to call on both business and housewives, are outstanding for their strict discipline and success, and seem worth the price of the book alone, the publisher says.

V V

Private Enterprise Sparked By Wilson Directive

The Chamber of Commerce of the United States, through its president, Richard L. Bowditch, recently expressed gratification at the Defense Department's directive for curtailing government business operations. The Chamber informed Defense Secretary Charles E. Wilson it is looking forward to "prompt implementation" of the new policy declaration.

In a letter to Secretary Wilson, Mr. Bowditch said:

"Your Nov. 24 directive (4100.15) regarding the curtailment of military, commercial and industrial type activities has been brought to my attention.

"We are deeply gratified with the soundness of your new policy declaration and are looking forward to its prompt implementation."

The Wilson directive, which was made public only recently by a House intergovernmental subcommittee headed by Rep. Cecil Harden (R. Ind.), served notice that the Department of Defense supports the basic principle that free competitive enterprise should be fostered by government. It added:

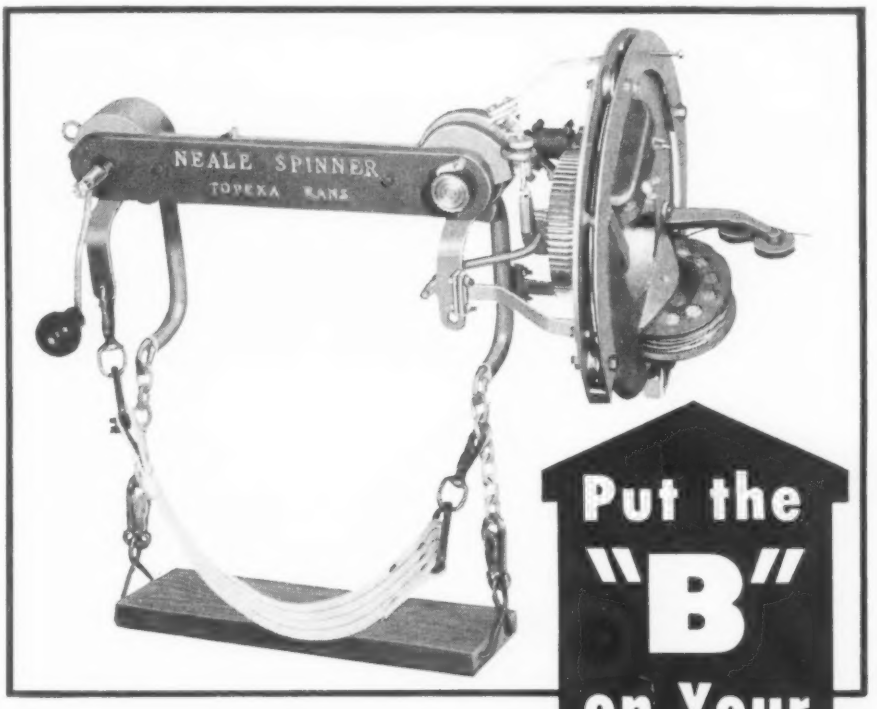
"Therefore, privately-owned or government-owned and privately-operated commercial and industrial type facilities will be used by the Defense Department to the greatest extent practicable. . . ."

Together with an accompanying order for the military services to discontinue processing iron and steel scrap, the directive represents one of the most significant steps yet taken by administration officials to remove the government from the field of private business operations.

While more needs to be done, the Wilson directive is regarded by the business community as a move in the

Answers to Quiz Questions On Page 42

(1) Magnetite.
(2) Reluctance.
(3) North and south.
(4) Permeability.
(5) Induction.



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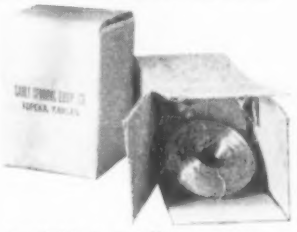

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right direction; a move in the direction of Chamber policy which holds that:

"Federal enterprises should be transferred, wherever practicable, to the people, acting for themselves or through private business entities created by them. Such transfer will reduce the federal debt; reduce or eliminate future federal expenses; increase revenues to federal, state and local governments through additional taxes paid by these enterprises under private ownership, and remove the federal government from unfair competition with its citizens."

The order on scrap was contained in a memorandum signed by Assistant Defense Secretary Charles S. Thomas. It requested the military services to indicate which of their 61 iron and steel scrap processing operations they propose to discontinue.

The Wilson directive said it is the policy of the Defense Department not to engage in operations of industrial or commercial type facilities "unless it is necessary for the government itself to perform the required work or service."

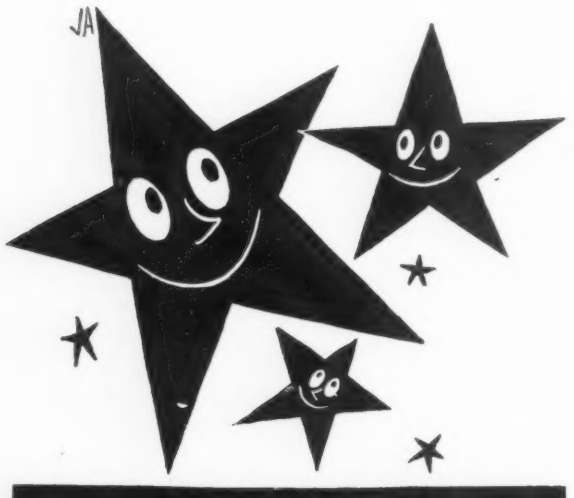
The directive listed the following factors which it said might justify the continued use of government-owned commercial or industrial activities:

The new exchange building of the Leesport (Pa.) Rural Telephone Co. housing new dial equipment which was recently cut over. Behind the building, the company also constructed a cinder block garage. Cost of the two buildings and exchange equipment was estimated at $200,000 by David Willits, president and general manager of the company. The president's father, Allen Willits, is secretary-treasurer. All toll and information calls are handled now by Bell operators in Reading, Pa. The company has 1,100 subscribers. It also has approximately 350 applications for telephones, most of which were received following announcement of toll-free service to Reading. The company plans to hold an open house in its new building soon.

(1) The absence of private facilities of sufficient capacity located within a reasonable distance from the point of demand. This may be particularly applicable in isolated areas. However, the possibility of inducing private industry to undertake the operation must be examined.

(2) Substantial savings to the government resulting from performance at a government facility, provided that the true cost basis must be used in evaluating government operations, including all allocable items of overhead and personnel.

(3) The necessity for meeting the military demand at all times without delay, particularly where abnormal or



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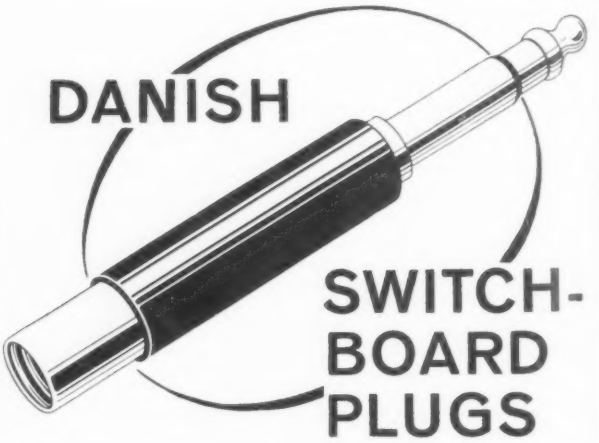

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These plugs provide unsurpassed precision in machining, solidity of construction, and high insulation safety.

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fluctuating military demand discourages private investment, with the result that the current or mobilization need cannot be met.

(4) The need for training military personnel for advance base or overseas operations where private sources will not be available for the particular work or service.

(5) In connection with certain operations, the necessity for complete command control to avoid compromise of highly classified security information.

(6) The necessity for protection of installations and personnel in areas of unusually hazardous operations.

(7) The necessity for the complete demilitarization prior to final disposal of certain types of military equipment.

V V

Two Bell Companies to Transmit Heart Beats By Telephone

It was recently reported that Arkansas physicians may soon be able to send and receive patients' "heart pictures," the scientific recording of heart performance, by telephone.

The arrangement would be similar to that used by news services, such as Associated Press, for transmission of pictures by wire.

Southwestern Bell Telephone Co. has asked the Arkansas Public Service Commission for authority to charge fees for transmission of such electro-cardiograms over its system. Doctors and hospitals would use the setup so the heart's action could be interpreted by other diagnosticians at distant points.

The Cincinnati & Suburban Bell Telephone Co. also disclosed that it has asked the Ohio Public Utilities Commission to establish rates for the same type of service, whereby physicians might send electro-cardiograms into Cincinnati for study by heart specialists.

The equipment can also be used to transmit encephalograms or "brain wave pictures," company officials report.

V V

BOOK REVIEW

"PRINCIPLES OF TRANSISTOR CIRCUITS," edited by Richard F. Shea, 535 pages. Price $11.

The first book-length treatment of transistors, published in September by John Wiley & Sons and edited by Richard F. Shea, "Principles of Transistor Circuits" is the work of nine experts at General Electric's Electronic Laboratory in Syracuse, N. Y.

The book presents basic theory and techniques of transistor application for both engineer and researcher. Since transistors assume so many different

"Don't tell me you've never seen a hydraulic tower before!"

physical forms, the authors provide a general treatment built around generalized equivalent circuits, which can then conveniently represent the great majority of these devices.

The book is arranged in three main parts which cover low-frequency, high-frequency, and large-signal, non-linear applications. The first of these sections contains material on direct-current, audio and ultrasonic amplifiers in their various forms and combinations.

The second part treats small-signal operations at higher frequencies of the order of 100 kilocycles to 10 megacycles, as amplifiers and oscillators. Circuits for the utilization of transistors in oscillators, intermediate-frequency amplifiers, and radio-frequency amplifiers are also included.

The last major part discusses such applications as flipflops, multivibrators, and pulse amplifiers, with one chapter devoted entirely to the theory of transient operation of transistors. The same general organization, followed in each section, deals with presentation and analysis of equivalent circuits, analysis of the mathematical relations, and development of applicable circuits.

The authors, who all have contended with transistor problems since the device's inception are, in addition to Mr. Shea: Woo F. Chow, Sorab K. Gandhi, Edward Keonjian, Vernon P. Mathis, Charles A. Rosen, John S. Saby, Johannes S. Schaffner, and Jerome J. Suran.

The book may be purchased through TELEPHONY.

V V

"Vigorous and enduring economic expansion requires not only that adequate amounts of capital be available but also that a sufficient proportion of the capital be of the risk-taking kind." —Excerpt from *The Guaranty Survey*, published by Guaranty Trust Co. of New York.

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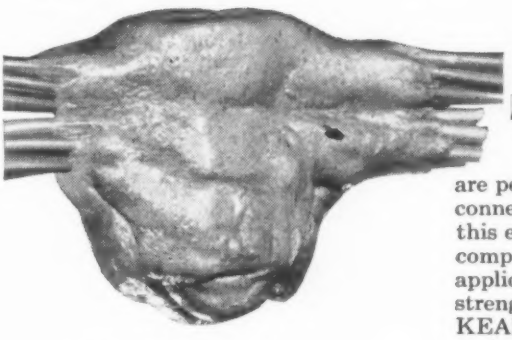

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are permanently sealed out of every connection that is protected by this easy-to-use, hand-moulded compound. Even on underground applications, the high dielectric strength and chemical stability of KEARNEY AIRSEAL give ageless, tight-sealing protection and insulation.

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The new Model R Ratchet Lever Hoist features Coffing's time-proved Safety-Pull ratchet-pawl construction — plus coil chain for extra flexibility. Chain wraps in any direction . . . resists rust and corrosion. For ease of servicing, the Model R may be completely disassembled in seconds with only a screw driver. For safety, each unit is tested at 100 percent overload.

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Barger to Handle Customer Service for Stromberg

Ralph H. Barger, commercial sales manager of the telephone division of Stromberg-Carlson Co., has been appointed customer service and installation manager, according to T. C. Thompson, sales manager. Mr. Barger heads a newly created department to

R. H. BARGER

better serve Independent telephone companies converting to Stromberg-Carlson step-by-step XY dial equipment. Assisting Mr. Barger will be David Balis, assistant installation manager who will spend a majority of his time in the field supervising new in-

DAVID BALIS

stallations and additions. These new appointments both became effective Jan. 1.

Mr. Barger is well known in the telephone field, having been with the company since 1911. Born in Wilson, New York, he spent his entire business career with the company starting in the switchboard department. In 1918 he was transferred to the engineering group and in 1921 to the sales engineering department. On Oct. 1, 1940, he was appointed telephone sales manager which position he held all during World War II.

From 1945 to date he served the industrial side of the telephone business as manager of commercial sales. A member of the Stromberg-Carlson Quarter Century Club, Mr. Barger also numbers among his affiliations the Telephone Pioneers of America and the Independent Telephone Pioneer Association.

Mr. Balis is a native of England and was born in Singapore, Strait Settlements. He came to this country in 1945 and joined the Stromberg-Carlson installation group in 1946. Before coming to this country, Mr. Balis lived in China from 1917 to 1939. He then moved to the Philippines where he and his wife were interned by the Japanese during the occupation from 1941 to 1945.

He became a United States citizen in February, 1951. Previous to joining Stromberg-Carlson, Mr. Balis was associated with the China Electric Co. at Shanghai, China, the Philippine Long Distance Telephone Co. at Manila, and the U. S. Signal Corps, Presidio of San Francisco, Cal.

V V

Whitney Blake Co. Electronics Headed by E. C. Quackenbush

E. Clarke Quackenbush, electrical engineer and specialist on electronic connectors, has joined Whitney Blake Co., New Haven, Conn., manufacturers of insulated wire and cable and custom-built cord sets. John Brown Cook, president of the company, announced that Mr. Quackenbush will serve as manager of a newly formed electronics division which will develop, manufacture and sell electronic connectors and assemblies.

A native of Minnesota, Mr. Quackenbush has been continuously associated with the design and development of electric connectors since 1925.

Following work for Pyle-National, he spent 13 years as a member of the engineering staff of American Phenolic Corp., Chicago, working in the field of electrical transmission equipment and electronics. He specialized in communication, transmission and lighting equipment, connectors and wiring devices and the dielectrics used in their design. He holds patents covering connectors and wiring devices and was one of the pioneers in the development of the AN connector line, now in general use in aircraft and many types of electronic equipment.

Before joining Whitney Blake Co., Mr. Quackenbush was engineer in

E. C. QUACKENBUSH

charge of the eastern division of Cannon Electric Co. He set up this company's plant in East Haven, Conn., and was in charge of its operation for several years.

He is a member of the Institute of Radio Engineers and the American Society for Metals.

V V

Gorman-Rupp Company Appoints Two District Representatives

Gilbert J. Kirwan has been appointed southeastern division district representative with headquarters in Atlanta, Ga., for the Gorman-Rupp Co., Mansfield, O. The Gorman-Rupp Co. also announced the appointment of Robert L. Nicolai of Edmonds, Wash., as its

G. J. KIRWAN

northwest division district representative, to serve as a liaison between factory and distributor.

The company sells pumps for use in construction, irrigation and petroleum field work.

Mr. Kirwan has been active in the pump business in the southeast since 1937. He was district manager for the Homelite Corp. from 1937 to 1950, and since then has been with Oberdorfer Foundries, Inc., pump division and the Ralph B. Carter Co.

Mr. Kirwan took his college degree at Notre Dame with graduate work at University of Kentucky which conferred an LL.B. on him in 1932. He affiliated with Gorman-Rupp during this past summer.

Mr. Nicolai has a background which includes teaching and selling, with ex-

R. L. NICOLAI

perience in life insurance and real estate. He attended Eastern Washington College of Education and received a B.A. degree in 1942. After serving in the U. S. Marine Corps with the rank of 1st Lieutenant until December, 1945, he resumed his studies and took a five-year secondary degree in 1950.

According to K. H. Cadigan, vice president in charge of sales, the two appointments are part of a sales and service program of the Gorman-Rupp Co. to keep pace with expansion of the pump business in the irrigation, construction and petroleum fields. He said the expansion has prompted establishment of a personalized service to distributors and customers.

V V

Knapp, Reynolds Named to Sales Executive Posts by Stromberg

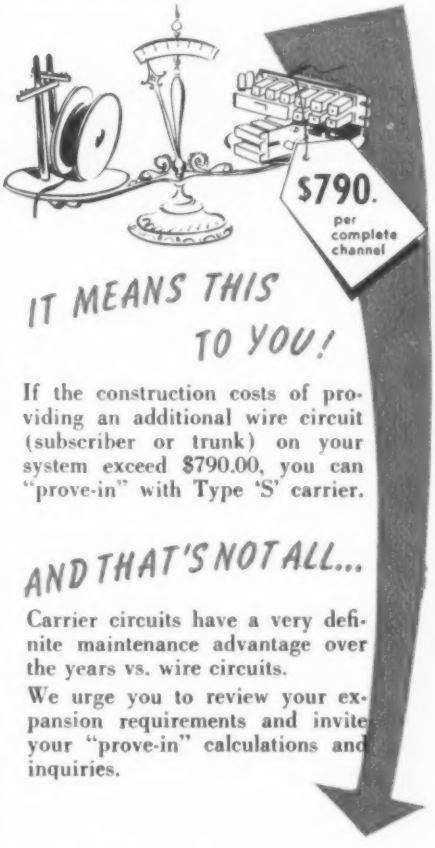
Colby H. Knapp, telephone supply manager of Stromberg-Carlson Co., has been appointed industrial sales manager of the telephone division. This is a newly created position, according to T. C. Thompson, sales manager. He will be assisted by Grant G. Orman from the national sales engineering department. Chester J. Reynolds, Chicago supply sales manager, replaces

"PROVING-IN" under 5 miles with type 'S' FM Carrier

Subscriber and Trunk

WHAT DOES IT MEAN?

It means that the cost of one complete (installed) channel of McElroy Type 'S' Carrier is less than the true cost of five additional wire miles, based on national averages!



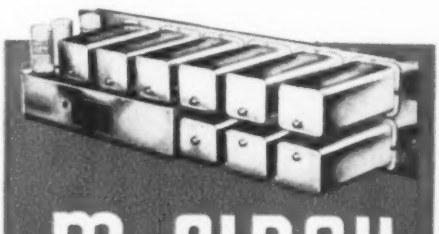
IT MEANS THIS TO YOU!

If the construction costs of providing an additional wire circuit (subscriber or trunk) on your system exceed $790.00, you can "prove-in" with Type 'S' carrier.

AND THAT'S NOT ALL...

Carrier circuits have a very definite maintenance advantage over the years vs. wire circuits.

We urge you to review your expansion requirements and invite your "prove-in" calculations and inquiries.



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C. H. KNAPP

Mr. Knapp as national supply sales manager.

Mr. Knapp joined the Stromberg-Carlson Chicago office in 1926 as an assistant in the shipping and receiving department. He advanced successively through radio sales, telephone sales, cashier and office manager. In 1942 he was called into the main office at Rochester to head the priorities department. After the war, he returned to Chicago in 1946 as supply sales manager, and

C. J. REYNOLDS

in 1949 was made national supply manager. Mr. Knapp was born in Lincoln, Ill., and attended the University of Illinois, class of 1928. Mr. Knapp will have his headquarters in Rochester, N. Y.

Mr. Reynolds, born in Princeton, W. Va., joined the company in 1943 as inventory clerk in the Chicago office. Moving successively from sales correspondent to order editor, he became supply sales manager of the Chicago territory in 1949, and in 1952 added the duties of office manager.

G. G. ORMAN

Mr. Orman was born in Liverpool, N. Y., and was educated at Rochester Institute of Technology, University of Rochester, and Syracuse University where he graduated with a B.S. in Electrical Engineering. His studies were interrupted by the war when he entered military service from 1943 to 1946 in the Air Corps. He joined Stromberg-Carlson in 1942 in inspection engineering, designing test equipment. He was transferred to telephone engineering in 1947, and in 1951 joined the sales engineering department, which position he now holds.

V V

R. B. Sayre Elected Graybar Vice President

R. B. Sayre has been elected a vice president of the Graybar Electric Co., W. E. Henges, president, announced recently.

R. B. SAYRE

Mr. Sayre started as a warehouseman at Memphis, Tenn., in 1921. Two years later he became supply salesman

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MOBILE, ALABAMA
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at Memphis, traveling the country territory of northern Mississippi, western Tennessee, Arkansas, southeastern Missouri and western Kentucky for more than 16 years.

In 1939 he was appointed manager of the outside construction department of the southern district, with supervision of the district's sales of outside construction materials at Atlanta headquarters and at the district's branch locations at Birmingham, Colombia, Knoxville, and Chattanooga.

He returned to Memphis in 1943 as manager, and in 1948 he was appointed peninsular district manager at Jacksonville, Fla. In 1952 he moved to New York as assistant vice president.

V V

J. W. Kelly to Manage Exide Sales in Boston Office

John W. Kelly of Decatur, Ga., has been appointed manager of The Electric Storage Battery Co.'s branch office at 100 Ashford St., Boston. Formerly a sales engineer with the company's

J. W. KELLY

Atlanta, Ga., branch, he will be responsible for sales and service of Exide industrial batteries in Maine, Vermont, New Hampshire, Massachusetts and part of Connecticut.

Kelly joined Exide's Atlanta branch in 1946 as a sales engineer after his release from U. S. Navy as a lieutenant commander. He traveled for the company in Georgia, Florida and South Carolina.

V V

"With human nature what it is, the surprising thing is that so few succumb to temptation and that such an overwhelming majority of the law enforcement officers of this country are so industrious, conscientious and incorruptible. . . ."—Hagerstown (Md.) *Morning Herald.*

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SIX POSITION MANUAL TOLL BOARD, Automatic Electric 63 Cord Circuits sleeve sup. Wired 20 equip. 15 C.B. or L.C. trunks. Wired 60 equip. 50 toll trunks. 50 R U Trunks, 8 info. trunks. One Calculagraph—wind, two elect. Calculagraphs. Ringing frequency buttons ca. pos. Also Harmonic Converter—two sets 5 frequency, two Interrupters, two busy tones, two dial tones. One Reed type—Frequency Meter. Write Commonwealth Telephone Company of Ohio, Athens, Ohio.

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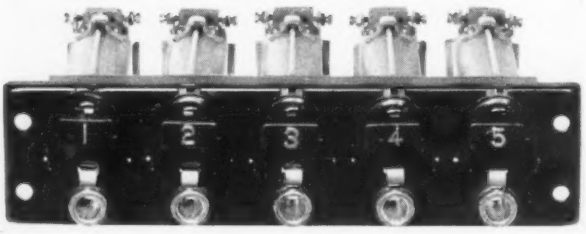

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